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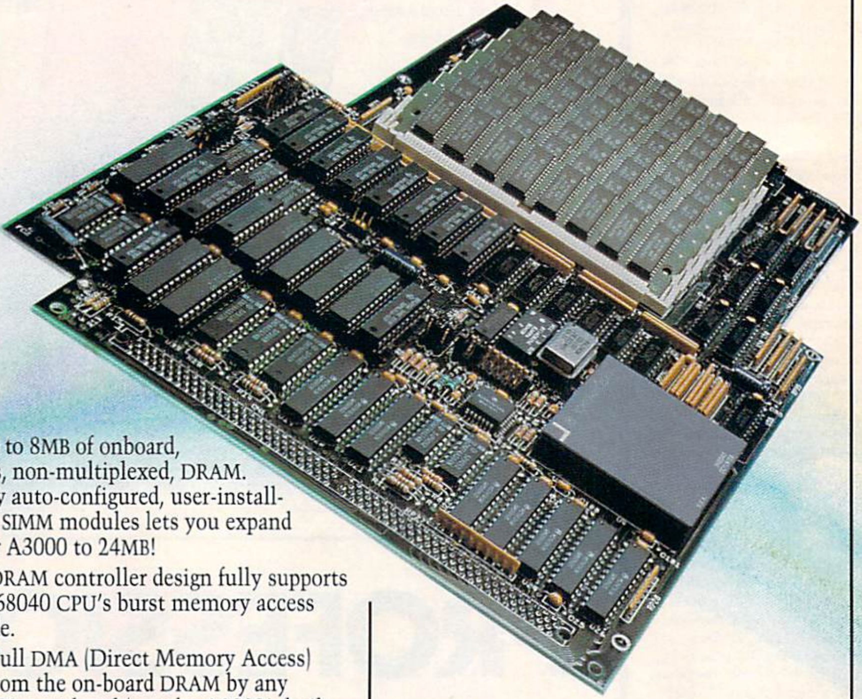
REVIEWS: • 3 Sample Editors
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An IDG Communications Publication

THINK ALL '040 ACCELERATORS ARE THE SAME?

THINK AGAIN!



As a high power Amiga® 3000/3000T user you need a 68040 accelerator board for one reason ... and one reason only ... SPEED!

And once you know what makes one 68040 accelerator better than another, the only board you'll want is the **G-FORCE 040** from GVP.

WATCH OUT FOR SLOW DRAM BOTTLENECKS

Yes, all 68040 CPU's are created equal *but* this doesn't mean that all accelerator boards allow *your* A3000 to make the most of the 68040 CPU's incredible performance.

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Not true for the **G-FORCE 040**...

SOLUTION: THE G-FORCE 040's FAST, 40ns, ON BOARD DRAM

To eliminate this memory access bottleneck, we designed a special 1MB, 32-bit wide, non-multiplexed, SIMM module using 40ns DRAMs (yes, *forty nanoseconds!*). This revolutionary memory module allows the **G–FORCE 040** to be populated with up to 8MB of state-of-the-art, high performance, on-board DRAM. Think of this as a giant 8MB cache which lets the '040 CPU race along at the top performance speeds you paid for.

SHOP SMART: COMPARE THESE G-FORCE 040 SPECS TO ANY OTHER '040 ACCELERATOR

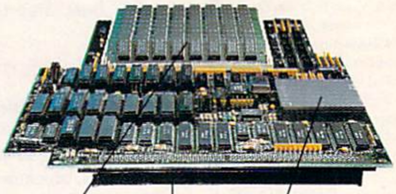
- 68040 CPU running at 28Mhz providing 22 MIPS and 3.75 MFLOPS! *NOTE: The 68040 incorporates a CPU, MMU, FPU and separate 4KB data and instruction caches on a single chip.*
- 0 to 8MB of onboard, 40ns, non-multiplexed, DRAM. Fully auto-configured, user-installable SIMM modules lets you expand your A3000 to 24MB!
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So now that you know the facts, order your **G-FORCE 040** today. After all, the *only* reason why you need an '040 accelerator is *SPEED*!

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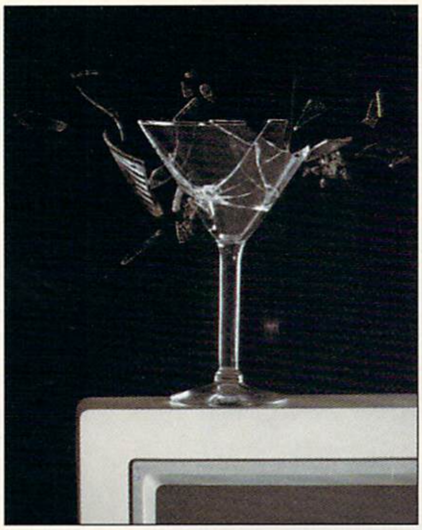
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e-e-e-y-a-a-h PING! Yes, shatter that champagne glass with an operatic high C and let's celebrate a new era in Amiga sound and music. With the new 12- and 16-bit hi-res sound-sampling equipment (see our lead story), you won't be able to distinguish your output from the real thing. And while you're at it, check out the rest of our special features to see what's new in music software and Amiga MIDI.

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AmigaWorld (ISSN 0883-2390) is an independent journal not connected with Commodore Business Machines, Inc. *AmigaWorld* is published monthly by TechMedia Publishing, Inc., an IDG Company, 80 Elm St., Peterborough, NH 03458. U.S. subscription rate is $29.97, one year; $46.00, two years; $64.00, three years. Canada $38.97 (U.S. funds), one year only. Mexico $38.97, Foreign Surface $49.97, Foreign Airmail $84.97 (prepayment is required on Foreign Surface and Airmail subscriptions in U.S. funds drawn on U.S. bank). All foreign rates are one-year only. Second-class postage paid at Peterborough, NH, and at additional mailing offices. Phone: 603-924-0100. Entire contents copyright 1992 by TechMedia Publishing, Inc. No part of this publication may be printed or otherwise reproduced without written permission from the publisher. **Postmaster:** Send address changes to *AmigaWorld*, Subscription Services, PO Box 58804, Boulder, CO 80322-8804. Nationally distributed by Kable News Co., *AmigaWorld* makes every effort to assure the accuracy of articles, listings and circuits published in the magazine. *AmigaWorld* assumes no responsibility for damages due to errors or omissions.

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With the most powerful, comprehensive 8-bit Digital Sound Package to ever orchestrate an Amiga

Digital Sound Studio

The Affordable Answer to Your Audio Dreams

Record, Edit, Compose . . .

With a high-quality stereo sound sampler, A fast, powerful, easy-to-use sound editor, And a self-contained 4-track sequencer.

For all the sound effects and music you could ever imagine.

▶ **Record** sound samples from any source, including voices, noise, and pre-recorded instruments, to create your own instruments and effects.

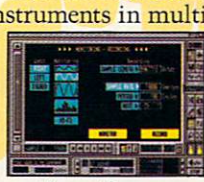
▶ **Edit** sounds quickly in real time. Add effects like reverb and echo, run sounds backward, alter wave forms, cut and paste sound segments, create loops, eliminate pops and scratches.

▶ **Compose** easily using the DSS 4-track sequencer and your Amiga or MIDI keyboard. Draw from up to 31 instruments at a time, in up to four octaves with 8 different variable effects. Mix and modify sounds in real time as you compose, through direct interface with the sound editor.

DSS Stretches the outer limits of 8-bit sound

- Create your own 4-track, self-playing musical compositions.
- Make soundtracks for home video, animation or visual presentations complete with voice-over, sound effects and music.
- Analyze voice patterns and stereo separation.
- Analyze graphic equalization of real-time sound.
- Remove "pops" from old phonograph recordings.
- Create custom instruments and sound effects by collecting and/or modifying pre-recorded instruments, voice, or sounds from any source, and use them in your own compositions.
- Save your sound and music to disk or send it out via modem for replay on any Amiga.





Check out these unparalleled features

✓ AmigaDOS 2.0 compatible; written in assembly language.

✓ Multi-tasking operation.

✓ 68020 and 68030 compatible.

✓ Comprehensive tutorial manual helps even beginners get started right away.

✓ Intuition-based graphic interface makes operation easy.

✓ MIDI-in capability.

✓ Direct interface between sequencer and editor.

✓ Hold 31 sound samples in memory at once – all shown on screen so they are easy to manipulate.

✓ Effects and processing capabilities include echo, mix, filter, re-sample, sound data inversion, playing sounds backwards, loops, fade-in/fade-out and more.

✓ Manipulate sound samples in real time, as you listen.

✓ Create sampled instruments with 1, 3 and 5 octaves.

✓ HIFI recording for highest quality playback.

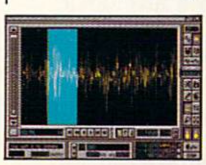
✓ Controls for faster/slower playback and filtering high frequencies during playback.

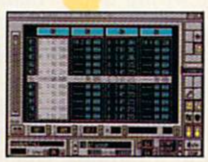
✓ Load and save samples, songs and instruments in multiple formats.

✓ Multiple effects for each note.

✓ Stereo and monophonic operation. Also convert mono to stereo or separate stereo.

✓ Auto-playing music modules.





✓ Real-time oscilloscope and spectrum analysis.

✓ Real-time reverberation.

✓ Graphic editing of wave forms through easy-to-use functions, including zoom in/out and precision controls for position, frequency and amplitude.

✓ Draw sound waves freehand using the mouse.

✓ Direct editing of individual sample numeric values.

✓ Maximum recording speed of 51,000 samples/second in stereo.

✓ Savable Preference settings.

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✓ Compatible with SoundTracker, NoiseTracker and SoundFX modules.

DSS™ 8

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CHIEF CONCERNS

Today's systems and programs give you a lot you had to work hard for in days of yore.

I HAVE USED a lot of computers in my day. As a guy that once covered PC news, I got loaner equipment nearly every week, as well as just about every software package ever written. Most of these systems were PCs, but there were a few Macs thrown in as well.

It was always exciting to set up a new computer or open the taut shrink wrap of a fresh program. So I'd methodically create new directories, install the beasts, and modify a few files to make it all work. But each and every time I loaded this or that new word processor, database, or business graphics program, I'd be disappointed.

Developers have figured out what people raised on TV remote controls want, and they are giving it to us, without sacrificing the power of these packages.

The problem was that all these programs were just empty shells, waiting for me to load in gobs of data, which I really didn't have. Sure, I'd pull down a few menus, and see how many absurd keystroke combinations it could tolerate before it crashed, but that would be it. To this day, standard productivity stuff turns me on about as much as Granny Clampett.

The lesson here is that a PC, at least a few years ago, was not a toy. It was for work, and that type of work isn't so much fun. And a computer that was enjoyable or easy to use was just not taken seriously.

Times have changed. On all systems, but especially the Amiga, computing is fun. And that's now okay. The new generation of programs doesn't demand to be filled with megabytes of gobbledygook so as to spit out well-formed rows and columns. Today's instant-gratification programs come with all the information installed, and it's up to you how to pull it out.

A good example is SuperJam!, a program from Blue Ribbon that I've been toying with a lot. (My staff probably wishes I'd stop.) SuperJam! includes the basics for a variety of music types, and you can jam moronically on top of classical, jazz, or rock music. Sure, when I do it, it sounds terrible, but it isn't nearly as bad as when I write music from scratch. And if I leave the program alone to do its job, it sounds pretty good.

A better example is Music Maker, my favorite CDTV application so far. Music Maker includes soundtracks on CD, and you can play real digitized instruments over them, just by randomly pressing number keys. It even has a mode that makes it impossible to hit the wrong note. Finally it includes a karaoke function that is sure to embarrass you in front of friends, bosses, and neighbors.

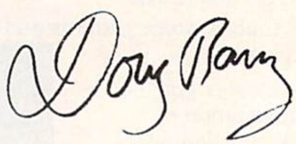
Our more standard Amiga applications also offer instant pleasure. With paint programs, you can have an unsightly image as quick as your hand can move. And with programs like Disney's Animation Studio, you can create a simple animation in less than a minute.

You might have guessed that I'm a relatively lazy computer user. That's why I'm such a fan of SCALA, which is as close as it gets to instant multimedia. With a few clicks and a few more keystrokes, I'm rewarded with slick transitions, moving text over a nice rich background, and interactive hot spots. Dan Quayle could even work this thing.

The instant usability of most of our programs demonstrates the maturity of our market. Developers have figured out what people raised on TV remote controls want, and they are giving it to us, without sacrificing the power of these packages. This allows us to use a wider variety of programs with ease.

CDTV is an even more radical computing paradigm. With CDTV, you can title videos, learn, and create, all by clicking on large boxes using a simple handheld device. And more power will come to these systems every month.

Ultra-friendly systems such as CDTV should make computers totally accessible, maybe even to daytime talk-show hosts. ■





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OVERSCAN

News, New Products and Networks

Commodore Plays To Win at CES

LAS VEGAS, Nevada—The Winter Consumer Electronics Show, the place to be for those interested in consumer-level entertainment and leisure technology, this year hosted intense Amiga activity. Considering how busy Commodore's booth was (even when the rest of the show was not) and the support of computer-game manufacturers (and even karaoke sing-along dealers), it is easy to see that the Amiga is both well represented and actively supported.

Commodore's impressive booth was packed with CDTV units, some A500s, and a few other models. CDTV was the star, however, and to prove it, CBM showed an impressive line-up of new and existing titles and accessories.

Commodore's **A592** CD-ROM drive played both CDTV software and audio discs. Originally called the A690, the A592 enables your A500 to run all CDTV software and access it through the computer's mouse and keyboard. A package nearly opposite in function is the new **CDTV upgrade kit**, which consists of an infrared wireless mouse, a keyboard, and a floppy drive—all in a stylish black, and all designed to access the computer inside your CDTV. Other **CDTV** hardware included a **trackball**, a **genlock**, and credit card-size **memory boards**.

Disc Breaks

Developers broke the seals on many new CDTV titles at the show. One of my favorites was **The Heroic Age of Spaceflight—NASA, The 25th Year** (***Troika Multimedia***). Covering such NASA projects as Apollo, Voyager, Viking, and the Space Shuttle, it is a fully interactive look at the US space program. It is also one of the first programs to take advantage of CDTV's new CDXL technology to play digitized video from the CD. In addition to the normal digitized images and audio, it incorporates a full 50 minutes of full-motion video, displayed at one-quarter of screen size.

Attendees got a preview of ***CDTV Publishing***'s new **Defender of the Crown**, an impressive update that incorporates the work of renowned Amiga artist Jim Sachs. Taking advantage of CD's massive storage, it offers plenty of animation, better sound, and more game play than the original.

On The Floppy Side

Compared to the last CES, there seemed to be more support for Amiga floppy-based games. ***Psygnosis***, for instance, has an aggressive 1992 lineup. Due this spring is **Agony**, wherein you use magical weapons to defeat the enemy. **Ork**, another high-speed arcade-style space game that should be available by the time you read this, offers multilevel

Continued on p. 14.

All for Music

BROOKLYN, New York—"Basement Recordings should be highly praised," states Rudolph Johnson, one of more than 500 people to take advantage of free classes it offers. The organization consists of engineers and computer technicians who volunteer their time to "bring technology to the community" through free six-week courses on MIDI.

Equipped with such networked devices as music synthesizers, samplers, effects processors, automated mixers, and tape recorders, Basement Recordings is well prepared to do the job. At least Commodore and Yamaha think so. Both have contributed equipment (including five Amigas), recognizing that Basement Recordings can help them develop and reach potential customers. Other companies, including Sony (which recently demonstrated some of its latest compact-disc equipment there), are also beginning to appreciate Basement Recordings. Last fall, Basement Recordings showcased products from 40 companies—many of them local. People "don't buy what they don't understand," founder and president Trevor John points out.

To help them understand, staff member Winston Jaffier developed an Amiga program called MIDI Educator, which "illustrates and explains the basic principals of MIDI-studio design."

Sound Proof

Johnson learned of Basement Recordings through a local newspaper. An Amiga user since 1988, Johnson had a problem. For his graphics business, which involves video titling, he needed to be able to produce quality sound.

"Basement Recordings was extremely helpful in showing me how the Amiga

Continued on p. 14.



OVERHEARD

Looking to have your music discovered? According to Computer Musician Coalition president Ron Wallace, "The AfterTouch project offers electronic musicians the ability to have their music heard, and membership in CMC provides an economical way to enjoy these treasures." With membership in CMC—a worldwide coalition dedicated to the advancement of electronics and computers used in music—you get access to the AfterTouch project (including catalogs and sampler tapes), community, and more. Membership is $90–$100, but a catalog subscription is just $5. For more information, contact the CMC at 1024 W. Willcox Ave., Peoria, IL 61604, 309/685-4843.

To locate the vendors of products mentioned, see the "Manufacturers'/Distributors' Addresses" list on p. 106.

Structured Upgrades

Aegis Draw 2000 2.0 ($199.95, ***Oxxi***) comes out of the gate with improved output on dot-matrix printers, configurable menu items, PAL support, and metric-ruler options. The new version also reads and writes AutoCAD files and supports three-point and parallel dimensioning. The program comes in three versions, each optimized and recompiled to run on Amigas equipped with accelerators and math coprocessors. For Aegis Draw 2000 owners, upgrades cost $49.95; Aegis Draw, Draw Plus, and Graphics Starter Kit owners can upgrade for $59.95. (RS# 114.)

Meanwhile, ***Stylus*** upped the ante in structured drawing with **ProVector 2.1** ($299.95). New features include a spline-drawing method that allows real-time curve drawing; real-time display of object outlines during editing, movement, scaling, cloning, and rotation; an edit function that lets you move a curve while retaining its slope; user-configurable rulers; the ability to import DR2D-format objects or drawings into your current project; and a tool for aligning objects with each other and the grid.

Object-manipulation tools are now configurable to stay selected until you call another function, and the Rotate and Scale tools can simultaneously clone with rotation and scaling, respectively. With 2.1, you can draw ellipses and rectangles from a corner of their bounding box or from their center, and rotate or size objects from their centers, corners, or any other reference point. The multiple UNDO function now supports more esoteric operations, and additional ARexx commands and macros add flexibility. (RS# 112.)

Safety with Style

Quarterback 5.0 (***Central Coast Software***, $75), the latest version of the popular back-up software, now gives you more options for backing up your hard drive. In addition to promising faster backups, an improved user interface, and increased file-selection versatility, Quarterback 5.0 offers the ability to back up or restore up to four floppies, streaming-tape back-up support, compression, optional password protection and encryption, among other options. To help you automate the process, Quarterback 5.0 supports ARexx as well as AmigaDOS 2.0. (RS# 109.)



ON-LINE SCAN

By Tim Walsh

In the realm of music making, I am accurately classified as "challenged." Thanks to my collection of sound modules, however, I do not need lessons or practice to make my Amiga musically gifted. Because the public domain is filled with all manner of Amiga music, you can find pleasing melodies whether your tastes lean towards classical or new age. Stand-alone sound-track modules and players pervade the public-domain libraries.

With these, youngsters can do their homework to the brain-dead beat of "Ice Ice Baby" provided by the Amiga. Name a Top-40 hit, and you are almost certain to find several variations of it in various sound-track formats on the networks. While you can turn your Amiga into a multitasking jukebox with only a few mouse clicks, finding those easy-to-use files does not at first glance seem effortless.

Settling the Scores

On-line music offerings at first appear to be an unmanageable smorgasbord of monumental proportions. Actually, they fall into three basic camps: MIDI libraries and editors (used primarily by musicians owning electronic music equipment beyond the Amiga), and (for more general use) sound tracks and the utilities needed to play those tracks. The latter two groups break down into specialized categories and levels, including prerecorded sound- and noise-tracker modules, prearranged Deluxe Music Construction Set (DMCS) scores, and hard-to-find DMCS instruments.

Finding music modules on any network is really quite easy. Just log into the Amiga area and use the keyword "module," "med," "mod," or "tracker" to search for the various types of music modules. If you're looking for DMCS music files, search on "DMCS."

If you want to assemble a collection of sound-tracker files, you may benefit from a Portal account: Portal offers the largest selection of sound modules of any of the big telecommunication networks, with almost 200 noise-tracker files alone.

Play Me

For playing digitized sound, you can turn to such applications as Commodore's AmigaVision or Progressive Peripherals' DiskMaster, although neither one supports sound modules. Modules—or mods, as they are commonly known—require sound-track players, and your modem and nearest network are the source for these.

If you are searching for a good Workbench 2.04-compatible player, try MED (Music EDitor) version 3.20 (MED320_1.LZH), which resides as file number 13441 in Library 7 on GEnie. In spite of its 278K size, this latest version of MED is one of the most heavily downloaded files in GEnie's Amiga area. It provides not only a music module player, but also a full-featured music editor.

CompuServe's Library 7 in the Amiga Arts area is home to MPLAY1.LZH—the program MultiPlayer. It supports Soundtracker and MED modules under both AmigaDOS 2.04 and 1.3, and offers an exhaustive list of features.

While BIX is not noted for a wealth of sound-tracker files, it does offer one of the best additions to the Amiga music scene in recent times: Ed Mackey's EdPlayer is listed in the Amiga.user Listings area as edplayer.lzh. It is not EdPlayer's ability to play both Mod and Med music modules that distinguishes it from others of this genre; multiformat players are commonplace. EdPlayer's claim to fame is its clever user interface. A replica of a compact-disc player, it has a fully functional control panel and dual-channel digital sound meters that operate in real time.

Finally, the networks also provide a great deal of information through their function as international meeting places for musicians. Most of them hold music forums and conferences on a regular basis and provide the minutes of earlier music conferences for downloading.

BIX
One Phoenix Mill Lane
Peterborough, NH 03458
800/227-2983

CompuServe
PO Box 20212
Columbus, OH 43220
614/457-0802
800/848-8199

GEnie
401 N. Washington St.
Rockville, MD 20850
800/638-9636

Portal Communications
20863 Stevens Creek Blvd.
Suite #200
Cupertino, CA 95014
408/973-9111 □

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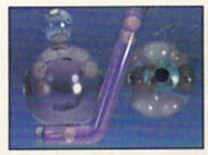
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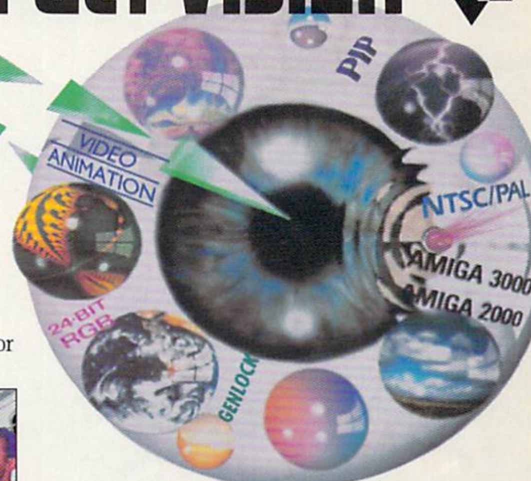




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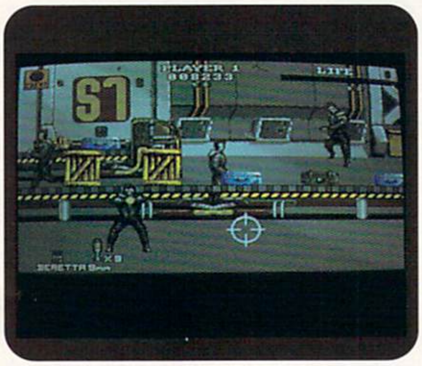
Dealers Circle 28 on Reader Service card.

IMPROVED MIRACLE

While ***The Blue Ribbon SoundWorks'*** Bars&Pipes and Bars&Pipes Professional work with the Miracle keyboard as is, the company went one step further, creating the **Miracle Tools** disk of three utilities. Replacing the Bars&Pipes' MIDI In tool, the Miracle In Tool reads Miracle notes into the sequencer and gives you remote control of Bars&Pipes' recording and playback functions from buttons on Miracle. With the Miracle Instrument Tool you can select Miracle instruments by name for each track in your composition. The Miracle Accessory reads Miracle scores into Bars&Pipes, as well as reading and writing Miracle Studio files. Retailing at $25, the Miracle Tools disk is available directly from Blue Ribbon for $19.95. (RS# 108.)

TERROR FROM THE BIG SCREEN

Talk about a rough day: You're the only person who can prevent the elite special forces—who are holding an entire airport hostage—from bringing planes crashing to the ground. In ***GrandSlam***'s **Die Hard 2—Die Harder** (24.99), you play the role of John McClane, and it's tougher than watching him in the movie of the same name. In this arcade version, you must survive a luggage battle, a snowmobile chase, a struggle on the wing of an airplane, and other challenges. Between the five levels are such subgames as air-traffic control, matching fingerprints, and radio communication. (RS# 104.)



The passengers are counting on you...

MIDI MIXER

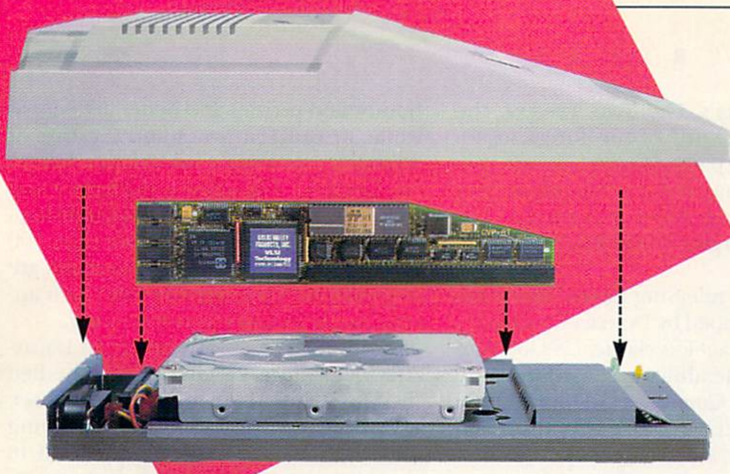
Supported by Dr. T's KCS, the **Niche Audio Control Module** ($479, ***The Russ Jones Marketing Group***)is a line mixer with eight MIDI-controlled, nonVCA gain elements, each with its own input and output. The ACM uses MIDI continuous controller data to adjust audio levels, and it promises a signal-to-noise ratio of more than 95 dB. (RS# 111.)



OVERHEARD

Artwork generated primarily through the Amiga—that's what the nonprofit CEPA Gallery seeks for its Third Annual Amiga Art Show. The submissions deadline is March 13, so hurry your stills (photos, prints, or disk files), animations or videos (disk- or VHS-based), or interactive work to 700 Main St., 4th Floor, Buffalo, NY 14202. Adequate postage—or check or money order—is required for the return of work submitted. Call 716/856-2717 for details.

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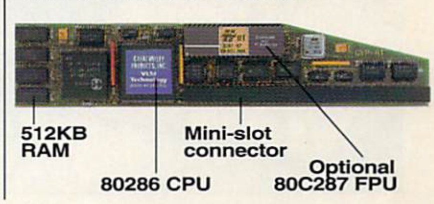
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CES, from p. 8.
scrolling, larger-than-screen-size aliens, and great sound.

Konami promises nearly a dozen new titles this year. Two that caught my eye were **Gods**, an action-adventure in which you play the role of Hercules, and **Magic Pockets**, an arcade game in which you, The Kid, must find your lost toys while destroying slimers, rockers, and froggers.

Electronic Arts and its affiliates showed numerous games, including **Siege** (Mindcraft), a real-time castle-storming simulation; **RoboCop 3-D** (Ocean), an arcade game based loosely on the movie of the same title; **Matrix Cuber** (Strategic Simulations), a sci-fi sequel to Buck Rogers; and **Celtic Legends** (UBI Soft), a strategy/role-playing game involving magic.

In ***Interplay***'s **The Two Towers**, the second in its Lord of the Rings series, you control a party of elves, dwarfs, humans, and magicians while protecting the One Ring from Saruman. For trekkers, Interplay offers **StarTrek: 25th Anniversary**.

Accolade is releasing **Super Space Invaders** (developed by Domark), a modern version of the ageless classic. US Gold, another Accolade affiliate, came forth with **Cruise for a Corpse**, a 3-D adventure; **The Godfather**, an arcade adventure; and **Cybercon III**, a 3-D shoot-'em-up.

Setting Standards

LucasArts Entertainment plans to release two major Amiga titles this year. The first is **Monkey Island 2: Lechuck's Revenge**. This sequel to Monkey Island offers more humor and puzzles and better art. Meanwhile, in **Indiana Jones and the Fate of Atlantis**, you must find Atlantis before the Nazis do. The game is the largest and most complex Lucasfilms has published, with over 200 rooms and more than 100 pieces of art. The game's characters are very realistic, too, deriving from such animation techniques as rotoscoping.

Both games take advantage of LucasArts' new software technology, embodied in iMuse. An AI-style music composer, iMuse creates music that fits the setting and actions of the current situation in the game, yet makes the changes seamlessly. More like a movie soundtrack than the music of previous computer games, iMuse promises to establish a new standard for quality in game soundtracks.

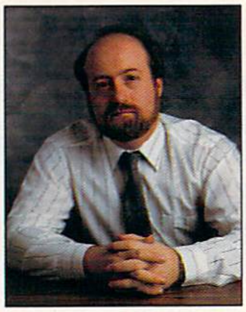
—Louis R. Wallace

All for Music, from p. 8.
worked in that environment," states Johnson. The volunteers taught him "how to control every component in a music studio through the Amiga." The knowledge gained from the course "allows me to do more for my clients," Johnson adds. With the help of musicianClinton Berry, whom he met while attending the Basement Recordings' course, Johnson is now adding sound to his video-titling work.

Also an Amiga user prior to taking the classes, Berry formed a mutually profitable business relationship with Johnson. This, however, was not the only symbiotic relationship to develop from the course. Both Johnson and Berry have stayed in contact with Basement Recordings, sharing their specialties as the organization expands into multimedia.

For more information on Basement Recordings, contact the group at 348 E. 51st St., Brooklyn, NY 11203; 718/485-7120

—Dan Huston ■



HELP KEY

Lou is no fool when it comes to fielding questions on Amiga computing.

By Louis R. Wallace

Seeking CD+G Discs

Q: *I recently bought a CDTV and hooked it to my Amiga via PARNET so I could use both CDTV titles as well as discs like the Fred Fish Collection. However, one thing I want to do and haven't had much luck with is finding CD+G discs. I do have the Jimi Hendrix disc, and I have heard there are others, but I can't find them. Do you know of any availability listing for CD+G discs?*

L. Lansing
West Palm Beach, FL

A: One of the biggest producers of CD+G is Warner New Media. You can write to them for information at the following address:

Warner New Media
CD+G Information
3500 W. Olive Avenue
Burbank, CA 91505

Warner has quite a selection of CD+G discs and will keep you up to date if you ask them to do so. For those of you who want to find some CD+G titles right now, without waiting for information, here is a partial list:

Alphaville
Breathtaking Blue

Laura Branigan
Laura Branigan

Ella Fitzgerald
Ella/Things Ain't What They Used to Be

Flamin' Groovies
Groovies' Greatest Grooves

Fleetwood Mac
Behind the Mask

Emmylou Harris
Pieces of the Sky

Jimi Hendrix
Smash Hits

Information Society
Information Society

Chris Issak
Silvertone

Little Feat
Hoy, Hoy

Little Feat
Representing the Mambo

Van Dyke Parks
Tokyo Rose

Gram Parsons
GP/Grievous Angel

Bonnie Raitt
Green Light

Bonnie Raitt
Nine Lives

Lou Reed
New York

Various Artists
Woody Guthrie Tribute

Johann Sebastian Bach
St. Matthew Passion

Ludwig Van Beethoven
String Quartet No. 14

Ludwig Van Beethoven
Symphony No. 7

Beethoven/Liszt
Symphony No. 9

Anton Bruckner
Symphony No. 9

Gustav Holst
The Planets

Gustav Mahler
Symphony No. 5

Felix Mendelssohn
Symphony No. 3

Wolfgang Amadeus Mozart
Abduction From the Seraglio

Henry Purcell
Dido and Aeneas

Power tools

Q: *I have a basic A2000 computer. I am interested in working with 3-D animation and video and want to make sure my Amiga is sufficiently fast and powerful for these tasks. Will installing a 2.0 Kickstart ROM chip and a 2-meg Super Fat Agnus be enough to make my Amiga fully compatible with the latest DOS? Can I do without the Super Denise chip (I have a 1084S monitor)? Will the 68040 cards function properly with my upgraded system?*

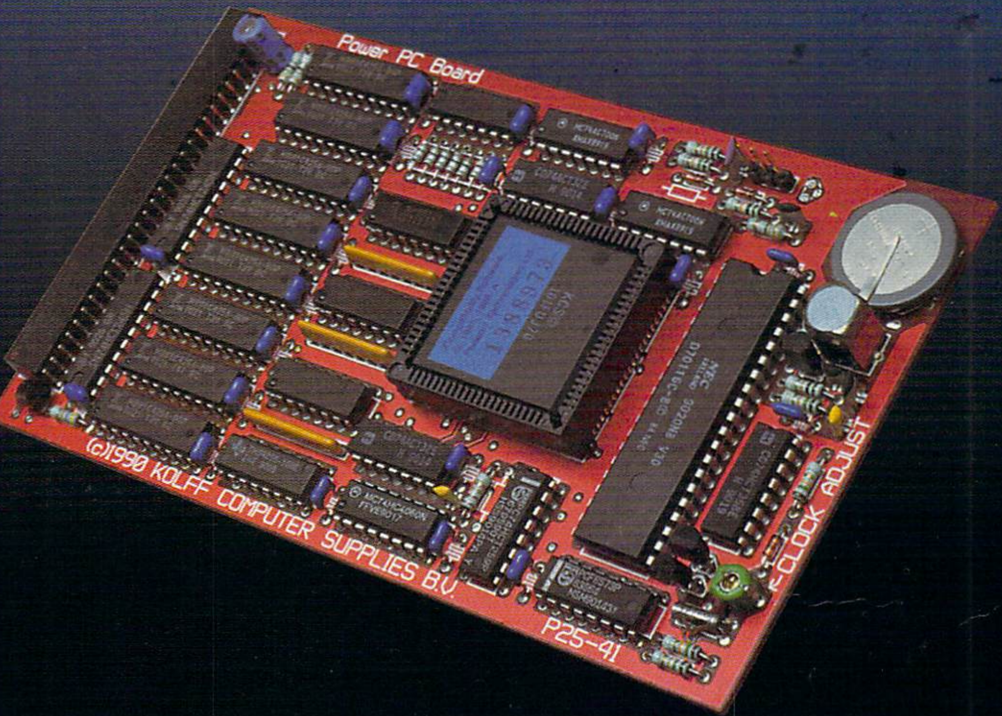
B. Braverman
Brooklyn, New York

A: For compatibility with AmigaDOS 2.0 on your A2000, you need the 2.0 Kickstart ROM and the 2.0 AmigaDOS software on disk. Both of these come with Commodore's 2.0 upgrade kit. While you don't need to have the latest Agnus or Denise, having them will give you abilities you wouldn't otherwise possess. For example, the new Denise chip allows several new display modes, including Productivity (640×480, four-color) and SuperHires (1280×400, four-color). SuperHires will work on your 1084S, but Productivity requires a multisync or VGA style monitor.

While upgrading to the 2.0 operating system will give you a lot more power and options—and the upgrade is something I heartily recommend—it will not give you any additional computing power for animation or video work. To gain that kind of power requires hardware upgrades. For video, you might consider any or all of the following devices: a genlock, a video digitizer, a digital video effects card, or a 24-bit display card.

To increase computing power on your A2000, you need to add a faster accelerator and memory. You can choose from 68020, 68030 or 68040 cards equipped with 0K to multiple megs of 32 bit RAM. I wouldn't recommend getting a 68020 card, since they are relatively slow, but one of the 25-, 33- or 50-MHz 68030 cards will work nicely. And if you want to really feel a rush of power, try a 68040 accelerator. Be warned, however, that once you get used to these speeds, you will never be satisfied with anything less! ■

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REVIEWS

The A-Team

Deltaware's A-Sound Elite

Oxxi's AudioMaster IV

SunRize's Audition 4

Sampling three flavors.

By Rick Manasa

A FUNNY THING happened on the way to multimedia: eight-bit audio. Already faced with memory- and processing-intensive graphics and animations, multimedia professionals look more favorably on the comparatively small file size of eight-bit audio. **Audition 4** (***SunRize***, $99.95), **A-Sound Elite** (***Deltaware***, $129.95), and **Audio-Master IV** (***Oxxi***, $99.95) each provide ways to get eight-bit audio in and out of the Amiga, while giving you the means to manipulate these sounds in a variety of creative and useful ways.

For purposes of this review, I tested all the programs with Oxxi's Aegis SoundMaster sampler, using each program's default settings for sample size and rate.

Audition 4

SunRize has certainly done its homework. Audition 4 is an improvement over early designs of Amiga sample editors, and it is fast and easy to use.

The manual opens with a brief description of digital audio and the sampling process. Audition 4 comes with on-line help, is not copy protected, and hard-drive installation is straightforward and well documented. After you set your sampler type, you're ready to record.

You get all the basic editing features with Audition 4, plus a few surprises. For example, you can delete or keep ranges, copy or cut ranges to the buffer, and replace values in a range with zeros. What's more, you can replace one section of a range with another and insert the buffer or blank space into the current sample. Advanced editing features include mixing and retuning samples, echoes, delays, flanging, and filtering.

Audition 4 has a few special editing features such as Smoothing, which applies a low-pass filter to your sample. By setting the cutoff frequency to a function of the sampling rate, this feature quickly removes any unwanted high frequencies from your sample. Maximize scans any range that you define, measures the highest amplitude, and scales the range to the maximum volume possible on the Amiga. Centralize corrects for the DC offset occasionally introduced by samplers. Lift Treble and Lift Bass act like treble and bass controls on your stereo.

The program has a Try feature, which lets you hear how an effect will sound before you commit to changing your sample. A welcome variation on this feature is Realtime Effects. This works like putting your sampler through a digital effects box, with echo, delay, flanging, and filtering applied while sampling. You do not actually need to create effects to hear the results. Indeed, Audition 4 is aptly named.

The sequencer lets you loop and repeat ranges to create songs, rap vocals, and the like. If you think of a sequence as a sample and a loop as a range, you won't have to learn a new set of terms. The Zero buttons help you find the best loop points in a sequence, and Sequence # lets you choose the one you want to display and work on.

Supporting Perfect Sound as well as Aegis SoundMaster, Audition 4 samples in mono or stereo and lets you mix "live" and previously recorded samples. You can set your levels with the aid of peak meters or an oscilloscope. The program provides precise control over the relative volume of the samples to be mixed, as well as over their threshold levels, sampling rates, and so on.

Audition 4 lets you create self-booting play disks of your samples and sequences. Unfortunately, when you boot them, you get a promotional message on the screen. If it were possible to run the audio under your own graphic or animation, this feature would be worthwhile. A more serious problem is that the playback is often garbled for 15- to 30-second stretches. SunRize is aware of the problem and has promised a fix shortly.

You can save samples as IFF files, as compressed IFF files (useful primarily for large voice files, where sound fidelity is not as critical), in Raw format (waveform data only), and as executable files (which you can play from an icon or the CLI). You can save instruments in either IFF or Sonix format.

One of Audition 4's unusual features is RAM Scan, which lets you see and hear what's in memory. While there is a lot of audio garbage in RAM, some of it is interesting. Just grab a range and treat it like a sample.

You can configure the program to suit your fancy. You can decide to show the oscilloscope, turn the low-pass filter on or off, display the peak-level meters and OK requester, your sampler type, and your favorite color scheme for bootup.

Audition 4 has a lot going for it. Written entirely in assembly language, it is small and quick. The logical user interface is well laid out, with lots of real-time effects and editing features such as recording directly to floppies. The Try feature is heaven sent, as is the automatic search for good loop points. The manual is well written, and technical support is knowledgeable.

On the downside, Audition 4 doesn't multitask well with MachIII running; it freezes while running WordPerfect on my A3000. In addition, I'd like to see

To locate the vendors of products reviewed, see the "Manufacturers'/Distributors' Addresses" list on p. 106.

more information on DC offset and the oscilloscope—perhaps a few examples and run-throughs printed in the manual would help.

AudioMaster IV

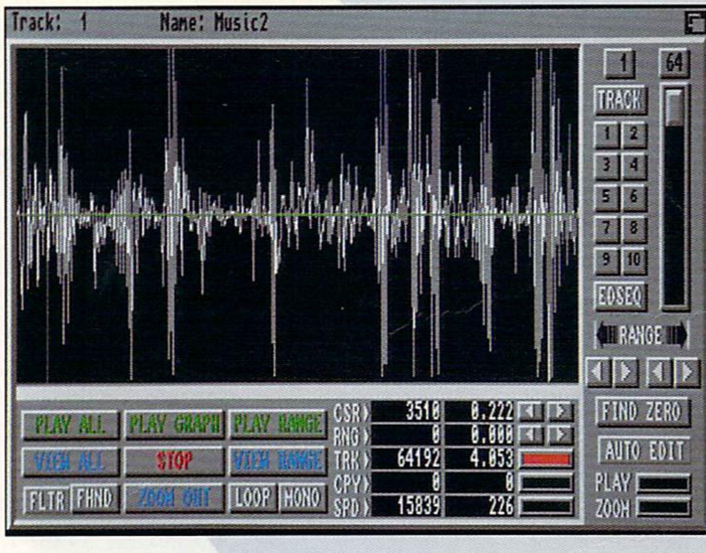
AudioMaster IV is the latest incarnation of the best-known sample editor for the Amiga (see Mar. '91, p.13, for a review). It now includes oversampling on playback, which is a software technique to help reduce or eliminate aliasing, that high-pitched whining you hear in the background of samples created at a low sampling rate. Samples created with other editors can take advantage of this feature when you play them in AudioMaster IV.

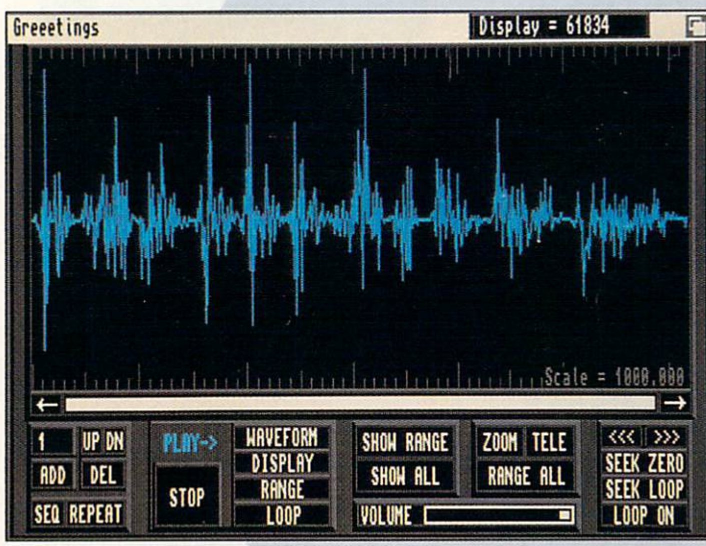
Another new feature is the ability to expand or compress samples over time. You can change sample pitch without affecting the speed, and vice versa. This allows you to match your samples to a video title length, animation, or even the time constraints of your answering machine's outgoing message.

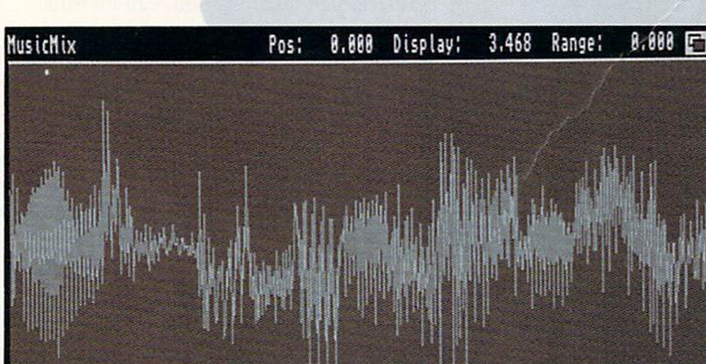
AudioMaster IV's improved digital filtering and bias control let you select whether to boost, cut, or pass frequency ranges by percentages from 1 to 100. DC Offset allows you to adjust waveform bias and samples from other programs that do not offer automatic bias adjustment.

There are some new displays and gadgets in the sampling window. For example, on-screen calibration markers make it easier to tell where you are in the sound file. You can zoom in and out of the screen display, and Scroll bars and gadgets make it easier to move waveforms through displays. A new progress meter displays the status of work in progress and beeps when AudioMaster IV finishes an operation. The screen refreshes and the file requester are also improved.

You have lots of control over the pitch and duration of your sample with AudioMaster IV. You can tune your sample to a provided reference tone or change the pitch to something com- ►







From top to bottom, the interface screens of Deltaware's A-Sound Elite, Oxxi's AudioMaster IV, and SunRize's Audition 4.

pletely different, all while the program plays your sample. You can also resample your data to a different rate without changing the pitch. This is useful for creating instruments for music packages on the Amiga, since most software requires instruments to be pitched at Middle C, or 8363 samples per second.

AudioMaster IV provides for many configurations and more samplers than any other editing package. It uses different sampling routines according to your sampler and the speed of your CPU.

While the program's samples are comparable to those created with the other editors, it shows its age when compared with the competition. Its file sizes are twice as large as those created by Audition 4 and A-Sound Elite (my test file was 1,519,988K vs. 642,724K and 647,624K, respectively). I could not use the stretch/compress feature on the AudioMaster IV file because of memory limitations (Not Enough Contiguous Memory message). The program could, however, perform functions with the same sample created with Audition 4, because of the smaller file size.

AudioMaster IV will appeal to those raised on the AudioMaster family of editors. The interface is very familiar, so you should be up and running in no time.

A-Sound Elite

A-Sound Elite is the new kid on the block, offering many features that are either poorly implemented or not found at all in either Audition 4 or AudioMaster IV. You can record and keep up to 32 different tracks in memory, use 20 different special effects, utilize ARexx scripting, and rescue yourself with an Undo button. These features make A-Sound Elite an editor that warrants serious consideration.

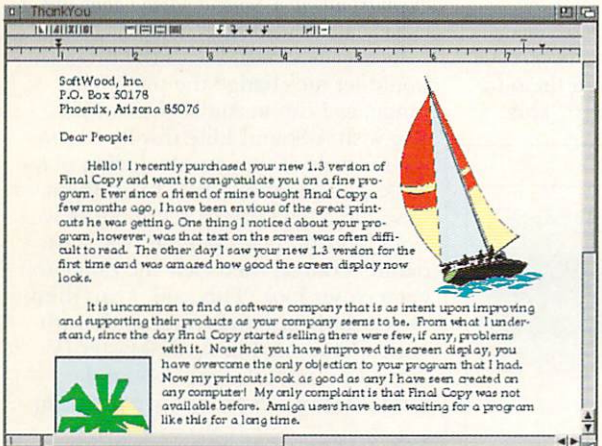
The colorful and logically laid out main screen shows a set of counters displaying cursor position, range, track, copy buffer, and playback speed by file size and time. The program's set of indicator lights displays the on/off status of the counters, zoom, and play functions. There are sets of left/right arrows for changing cursor position, adjusting start and end points of ranges, and moving ranges around the sample. The precision these controls afford is a welcome change from the guesstimates required to set ranges accurately in either Audition 4 or AudioMaster IV.

You can make multiple program configurations with A-Sound Elite. Such items as warnings, icons, and an event log can all be toggled to suit your needs and saved for later.

A-Sound Elite provides a wider range of processing tools beyond the standard Mix, Echo, and Backwards effects for your samples. The Click filter will help clean up noisy clicks and pops, and the Disguise feature adds an interesting "talking-in-a-tube" effect to voice samples. Double-Track mixes a range with itself, then plays the two slightly out of sync, producing a "fatter" sound.

Like Audition 4, A-Sound Elite lets you record your sample directly to disk, allowing for longer samples—up to 960K per disk. Unfortunately, you cannot edit work recorded directly to disk. Also, as with Audition 4, you must use a supplied playback program to play your samples. Worst of all, I couldn't get this feature to function on my A3000. Deltaware knows of the problem and plans to have this and other enhancements included in version 1.2, which should be available by ►

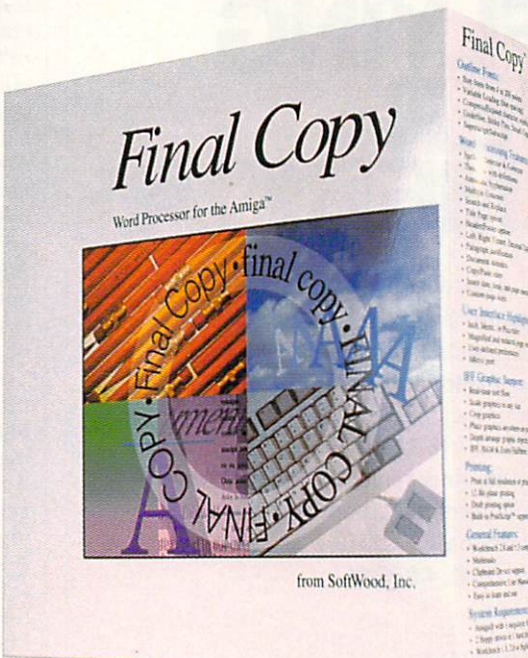
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Comparison Chart	Outline Fonts Included	Crop Graphics	Load Simple HAM graphic	Thesaurus Synonyms	Speller Words	Snaking Columns	Graphic Text Flow	Automatic Hyphenation
Final Copy 1.3	35	Yes	3.5 sec.	470,000	116,000	1-6	Yes	Yes
ProWrite 3.2®	0	No	1 min 20 sec	300,000	100,000	1-5	No	No

Comparison Chart	Price	Frame Graphics	24 Bit ILBM Support	Thes. with Definitions	Page Views	Print 1 pg. Document	ARexx	Use Amiga Clipboard
Final Copy 1.3	$99.95	Yes	Yes	Yes	25-400%	53 sec.	Yes	Yes
ProWrite 3.2®	$174.95	No	No	No	No	2 min 5 sec	Yes	No

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the time you read this. There are even plans to support the MIDI sample-dump standard down the road.

These caveats aside, A-Sound Elite has a great many nifty features that make it special, including a sequenced loop editor that chains whole samples or portions of samples together into longer passages. A-Sound Elite can also import and edit 16-bit samples, although you can only cut and paste them. You cannot process the samples with any of the special effects, but you can speed up system processing with the Turbo option. This speed increase is most noticeable when processing longer samples or when multitasking heavily. You can save your samples in ASF, IFF Sonix, or Raw formats over a one- to seven-octave range.

A-Sound Elite's ARexx support is extensive, allowing you to send or receive over 100 commands to and from the program. You can also create ten ARexx macros and assign them to function keys F1 through F10. This makes A-Sound Elite your only option if you control your multimedia applications with ARexx scripts.

The manual is very well written. The tutorials and reference sections walk you through all aspects of the program. Always partial towards tutorials, I appreciate Deltaware's taking the time to explain all of A-Sound Elite's features clearly and thoroughly.

Its merits stated, I wish the program would let me change the pitch of a range, as I can in AudioMaster IV. I also wish A-Sound Elite displayed the audio levels of the sample during playback, as does Audition 4. In addition, A-Sound allows you to zoom out only from a portion of a sample. You must define a range, then view the range to get a closer look. This said, I can think of very little else that you can do with either Audition 4 or AudioMaster IV that you cannot do with A-Sound Elite—a very comprehensive program.

It's a Wrap

In summary, all three editors performed the basic functions well. All create usable samples with a minimum of fuss, and all have numerous special effects that you can apply to samples to shape them almost any way you desire. Consider AudioMaster IV if you own AudioMaster III and want to be on familiar territory. Oxxi provides an upgrade path, good customer support, and is an established Amiga company. AudioMaster IV supports several different Amiga samplers, which is good news for those using an old Mimetics or A.M.A.S. sampler.

Audition 4 is from SunRize, another company with a long Amiga track record. If you have any intention of working with professional audio on your Amiga, SunRize is currently the only game in town, with its 12-bit and pending 16-bit digital-audio cards (which Audition 4 supports). Audition 4 is written in machine language, writes files that are half the size of AudioMaster IV's, and records to disk. While Audition 4 does have a Try feature, both it and AudioMaster IV could use an Undo button and more hot keys.

A-Sound Elite offers the most features, with 32 tracks, record to disk, extensive ARexx support, and the blessed Undo button. Its file sizes are comparable to those created by Audition 4. Deltaware is a smaller operation than either Oxxi or SunRize, so customer support is not always as immediate, but they do call back and answer your questions.

While fancy graphics and animations ►

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get a lot of attention, the importance of sound in multimedia cannot be overemphasized. With eight-bit audio becoming the de facto standard for multimedia, well-designed and powerful sample editors for the Amiga will become more and more important to the multimedia professional. Audition 4, AudioMaster IV, and A-Sound Elite are all capable of filling the bill.

Art Department Professional 2

ASDG

Imagemaster

Black Belt Systems

Taking the choice out of image processing.

By Geoffrey Williams

WHEN IT COMES to image processing, ***ASDG***'s **Art Department Professional 2** ($299) is the first product to come to mind. Now AD Pro stands shoulder to shoulder with a newcomer from ***Black Belt Systems***, **Imagemaster ($199.95)**. When it comes to choosing between them, however, there is no choice to be made. If you work professionally with Amiga graphics, have aspirations to do so, or simply want professional-quality work, you need both of them.

These programs complement each other very well. For the most part, both have a full range of image-processing tools, although each takes a different approach.



AD Pro 2.0's control panel.

Serious Business

Both of these programs work in true 24-bit, even when you are manipulating standard Amiga images in 16 or 32 colors. This lets you assemble composite images regardless of color depth or resolution. It also means that they must manipulate a lot of data, so a fast processor and additional memory make them much easier to use. While AD Pro will work with just 1MB of RAM, 4MB is more realistic for full functionality. Imagemaster needs 1MB of Chip RAM and 3MB of Fast RAM.

Both programs offer sophisticated ARexx control, which helps you with batch processing operations such as manipulating animations frame by frame. If you wish, you can create mini-programs that perform sophisticated, customized, multifunction tasks. Of course, you can also launch ARexx program scripts through macro keys.

While both programs have button-based interfaces, they differ vastly. With AD Pro 2, you cycle through the program's options with a single button (an annoyance that you avoid if you are running Workbench 2.0; its buttons bring up scrollable lists). Imagemaster provides one button for each individual function. Consequently, it is not always easy to find an individual operator on a screen loaded with buttons.

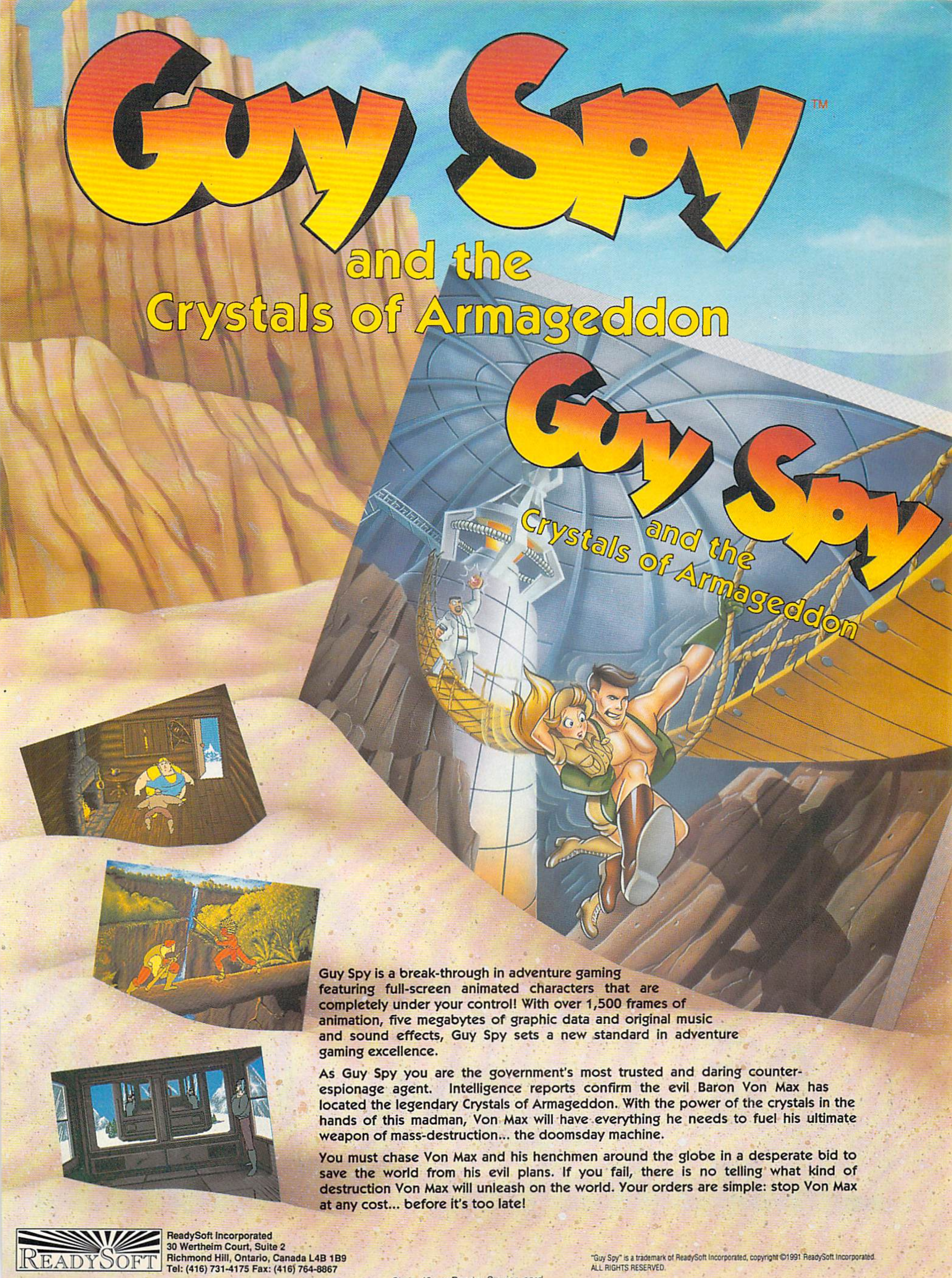
Imagemaster and AD Pro 2 both let you create composites by layering several images together, offering a variety of image-processing functions. They are worlds apart, however, in functionality and in additional features.

Who Is That Masked Image?

Imagemaster provides over 15 different ways to select a section of the work screen. You can use complex color masks or cut out shapes with a variety of tools to blank areas of the screen. These shapes can be simple rectangles and ellipses, or, if you use the polyarc tool for cutting curves, they can be more complex shapes. AD Pro 2, however, is designed to work primarily with entire screens, and so lacks the sophisticated masking and area-selection tools of Imagemaster.

These two programs share most of the basic image-processing features, such as Brightness, Contrast, RGB, and Gamma correction, as well as Sharpening, Blurring, Colorizing, gray-scale conversion, removal of isolated pixels, noise and artifacts, Negative, Scaling,

Continued on p. 76.



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ILLUSTRATED BY LESLIE COBER

'SAMPLING'

THE FUTURE OF SOUND

New 12- and 16-bit Amiga sound-digitizing hardware is about to blow the doors off traditional eight-bit sound sampling. What does the new technology mean and which companies are "sounding off" the loudest in this new high-performance arena?

By Bob Lindstrom

It takes a lot to keep Amiga musicians quiet, but serious music enthusiasts have been waiting silently and very patiently for the third generation of Amiga sampling hardware to make a noise in the marketplace. At long last, there is on the horizon a new group of sound digitizers—led by SunRize Industries' AD1012/516/1016 boards—that will outperform anything yet heard on the Amiga. Their faster sampling rates, higher bit resolution, direct-to-hard-disk digital recording, and advanced digital playback will earn the Amiga a place at the center of a professional sound studio. For the less technical ear, what this third generation of samplers signifies is more full-bodied timbre, increased sonic clarity, and audio performance to rival compact discs.

COUNTING THE NOISE

Unlike conventional phonograph and tape recordings that preserve a replica of the original sound waves, digital samplers take numeric "measurements" of the sound that are later used to reconstruct the original timbres. The accuracy of those measurements determines how closely the digitally reproduced sound will resemble the original.

Two factors are fundamental to achieving that tonal accuracy: sampling rate and bit-resolution.

The *sampling* rate dictates how often the computer will take a measurement of the sound wave. Like any set of measurements, the more you take, the more accurate the sample. Additionally, the highest sound frequency that a sampler can reproduce accurately is no higher than half the sampling rate. Therefore, a stock Amiga sampling at its highest rate—just under 29,000 samples per second (sps)—cannot accurately reproduce a sound frequency higher than 14.5KHz. Hi-fi, it ain't.

In fact, unless you filter out higher frequencies on a stock Amiga, you will hear the whistling distortion that an inadequate sampling rate produces. The solution is a higher sampling rate. Compact discs, for example, ►

avoid this problem by sampling at 44,100 sps to achieve a high-frequency limit of 22KHz—well beyond the hearing range of most human beings.

Bit resolution determines the degree of the measurements' accuracy and refinement. With the eight-bit resolution of the Amiga's internal digital-audio hardware, there are only 256 levels of accuracy in the sample measurements. Boosting to 12-bit resolution generates 4096 different levels, while full 16-bit resolution—the same as for compact discs—provides a range of 65,536 values for the sample. If the technology here goes over your head, the effects won't slip unnoticed past your ears. Higher bit resolution means a greater difference between the loudest and softest sounds in a recording and, therefore, more vibrant, dynamically life-like reproduced sound.



The first generation of outboard samplers whetted our appetite for chipmunk "doo" choirs and built-in percussion tracks. For the serious musician, however, the Amiga's lower sampling rate and eight-bit resolution produced sound that was a bit muffled and, when properly filtered to avoid distortion, resembled AM radio with the treble turned down.

The second generation of eight-bit samplers—including such systems as GVP's Digital Sound Studio and Oxxi's Aegis SoundMaster—exploited the enhanced processor speed of the A3000 and accelerated A2000s by increasing the sampling rate. By digitally recording sounds at up to 48K samples per second (sps), we effectively "turned up the treble" and reaped a wider frequency range—recovering the crispness and clarity, but still missing the wide dynamic range and lower noise that more bit resolution could achieve.

For sampling fanatics, the third time looks like the charm. The new internal digital-audio boards not only operate at higher sampling rates, but also record at the higher 12- and 16-bit resolutions. With these add-ons, we won't just turn up the treble—we'll also turn up the volume and turn down the noise to get audio performance approaching and even surpassing the quality of CDs. In addition, this third generation of samplers will work in conjunction with hard disks, MIDI sequencers, and SMPTE-synchronized devices to integrate digital recording into your total Amiga music studio.

THE SUN FINALLY RIZES

For some time, a handful of vendors have been tantalizing Amiga sampling enthusiasts with lists of features and specs these hi-res sound digitizers reportedly will possess. Unfortunately, at the time of this writing, none had been released.

AmigaWorld, however, did receive for this article a prototype version of ***SunRize Industries*' AD1012 with Studio 16** software, a 12-bit audio sampling and direct-to-hard-disk recording system for the A2000/A3000. What follows is a preview of this product in an unfinished, prerelease version—plus a look ahead to some other prospects on the hi-res horizon. *(Editor's Note: SunRize Industries reports that the final-release version of the AD 1012—with the fully implemented 1.0 Studio 16 software—should be shipping by the time you read this article. The scheduled list price is $595. Please consult the accompanying box, "SunRize Sampler Update," for further details.)*

Although it is the first player on the hi-res sampling bandstand, the AD1012 reflects the kind of audio quality and recording/editing power that probably will be typical of the third-generation boards.

First, the AD1012 decisively improves upon the Amiga's digital-sampling prowess. It can record and play a single monaural sample of 12-bit resolution (though the board uses and saves files in 16-bit resolution), making use of the 12-bit amplitude range of 4096 possible values. In addition, the AD1012 can sample at rates up to 80,000 sps—far in excess of the 44.1K sps rate of compact

SunRize Sampler Update

PLANS FOR THE first of ***SunRize Industries***' new sampling devices call for the release of the **AD1012** with the 1.0 version of the Studio 16 software by February 1, 1992—which means it should be shipping by the time you read this.

SunRize intends to follow up on this 12-bit digitizer with two 16-bit devices: the **AD516** and the **AD1016**, both of which will come with Studio 16. The AD516, according to SunRize, was due to ship by March 1. A release date for the AD1016 had not yet been determined. The company promises that AD1012 users may upgrade through a full refund applied towards the purchase price of either card.

With their full 16-bit resolution, these new models promise even more accurate sampling, more sophisticated features, and higher quality sound. In terms of power, these boards should really cook: The AD516's digital signal processor (DSP) is a 40 MHz ADSP-2105 rated at 10 MIPS (millions of instructions per second), while the AD1016 is scheduled to use a blazingly fast Motorola DSP56001 processor rated at 12.5 MIPS.

Amiga musicians should have a great deal to savor when full 16-bit sampling hits the market with a very loud bang! □

discs. Although the AD1012 samples only in mono, it is designed to play back up to four channels of samples simultaneously when installed in an A3000 or an accelerated A2000.

Extending its sampling capabilities, the AD1012 also serves as a direct-to-hard-disk recording system. Spooling samples directly to hard disk, the AD1012 can produce samples whose lengths are limited only by hard-drive storage capacity. Be aware, however, that recording a mono sample at a 44.1K rate eats up 5MB of disk space per minute. Most real-world hard-disk recording situations require disks of 200MB and larger in capacity. When used in conjunction with a SMPTE time-code reader built into the AD1012, such a recording system can play hard-disk-based recordings in sync with any MIDI sequencer, tape recorder, or other SMPTE-synchronized device.

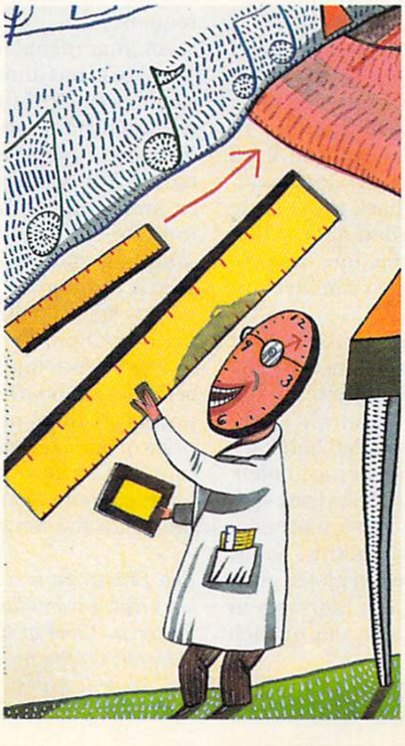
Enhancing The Tone

The AD1012 installs into a single Zorro slot on the A2000 or A3000 (no version is planned for the A500/A1000). On the back plane are three RCA plugs: one each for unbalanced, consumer line-level audio input and output, and a third to accept SMPTE linear time code (LTC) input.

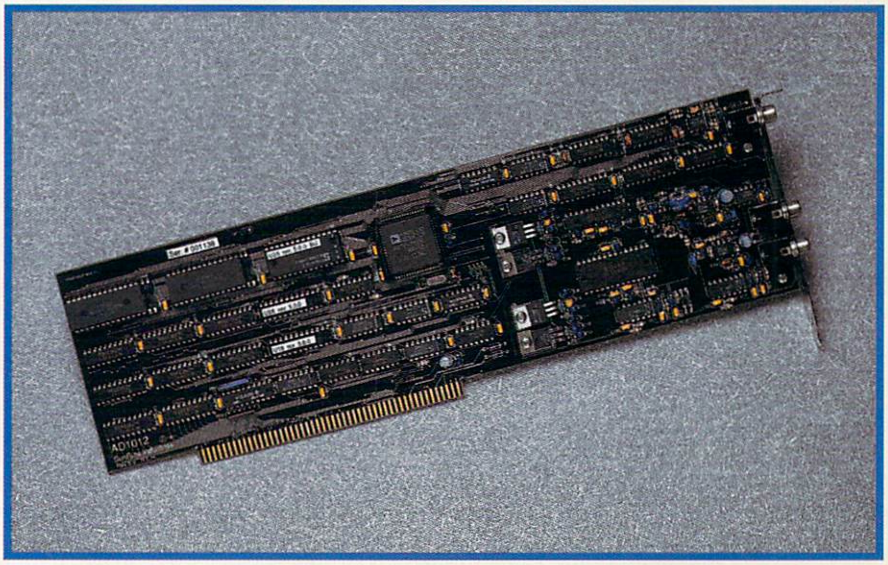
A high-quality audio source should be connected to the input of the AD1012. With its increased bit-resolution, the AD1012 is even less forgiving of poor source material than eight-bit samplers. Be aware that the line-level input will not accept a microphone; therefore, you will need to route microphone input at line level from a mixing board, or at least to prerecord live material and then patch the recording into the AD1012 for sampling.

Prerecording source material defeats spontaneous sampling from a mike, but it also enforces good sampling habits. Most samples recorded directly from microphone input are cursed with unusually high noise levels, regardless of the quality of the sampler. As a general rule, it is far better to prerecord and equalize your input material before putting your sampler to work.

Similarly, the 12-bit resolution reproduced at the AD1012's audio output places more demands on your amplifier and speakers than the Amiga's eight-bit sound. If you have a serious use for the AD1012, the chances are good that you already have a quality sound system connected to your Amiga. If not, the AD1012 may motivate you to upgrade.



The SMPTE input port should already be familiar to Amiga multimedia creators who have used Dr. T's The Phantom MIDI/SMPTE interface ($350). The AD1012 SMPTE port can be addressed to trigger



SunRize's AD1012: A "bit" more than samplers that have come before.

AD1012 sample playback in real time, synchronized with other SMPTE-controlled devices. Because the AD1012 SMPTE is a reader only, it will require SMPTE time code from an external generator or a tape track previously striped with SMPTE linear time code.

Note that in its current form, the AD1012 is not designed to understand LTC in fast-forward mode, and it does not read vertical interleave time code (VITC) without converting it to LTC (outboard converters, however, are available from other vendors). Also, the preliminary version of the Studio 16 software provided with our AD1012 was equipped to read SMPTE LTC only at 30 frames per second. According to SunRize, however, the final 1.0 version of the software will allow the AD1012 to read all SMPTE formats.

At the board level, the AD1012 contains high-quality recording and playback circuitry and a digital signal processor (DSP) that supports the hi-res sampling. Another nifty talent of that DSP is its skill as a real-time digital-effects processor. Another preliminary piece of accompanying software used the AD1012 for some nice chorusing, delay, multitap, and flange effects, all produced on the fly from the source material.

So how does the 12-bit AD1012 sound? Absolutely great! As you would expect from the combination of higher sampling rates and ►

increased bit resolution, the AD1012 pumps out the cleanest, clearest, most wide-ranging audio yet heard from an Amiga. A piano sample I recorded at 44.7K sps exhibited respectably low noise and a richly authentic timbre, ranging from softly subliminal bass notes to piping-loud high notes. Only a slight restriction in the overall dynamic range and a trace of fuzziness at the high end betrayed that this was not full 16-bit sampling.



Studio 16

SunRize includes the Studio 16 controlling, syncing, sequencing, and editing software with each AD1012. As part of its object-oriented design, all major functions of Studio 16 exist as independent modules, each performing a separate function, such as recording, SMPTE sync, sample editing, input metering, and channel mixing. Depending on your needs and your RAM limitations, you may make any number of these modules memory-resident.

The beta version of Studio 16 that we received was full-featured but not comprehensive. It did not—as yet—have multiple channel playback or a full SMPTE-sync implementation, as noted above. (Again, according to SunRize, these features are now present in the final 1.0 version.) Also, the editing module did not have the digital filters and other advanced data-manipulation options that are now common in high-end eight-bit sample-editing software. (These features, reports SunRize, will not be contained in 1.0, but may be added to a future update of the software.)

To support the AD1012 as a direct-to-hard-disk recording system, the editing software does provide the option of performing destructive or nondestructive edits. When cutting and pasting samples, Studio 16 will either permanently alter the data on the hard disk (destructive) or save pointers to the data (nondestructive) that permit you to play back the sample as edited without changing the recorded data. When the sample is fine-tuned to your satisfaction, the program will rebuild a new version that you can save under an alternate name.

A Tiny Queue List module enhances the AD1012 as a recording system by SMPTE-synchronizing the playback of up to four simultaneous samples. There are unlimited ways to exploit this feature in real-world applications. Vocal parts can be digitally recorded and later SMPTE-synced with a MIDI sequencer, or a complete sound-effects track can be automated for playback with a MIDI-recorded musical score when you are producing multimedia, film, or video presentations. Sadly, what the software lacks is a way to perform global edits on multiple samples. If you want to lose four bars in all four samples, you have to chop them out of each sample individually.

Studio 16 supports several digital-audio file formats, including AIFF 16-bit, the Apple Macintosh standard; AIFF 8-bit; IFF 8SVX, the Amiga's most common 8-bit format; and CDTV Raw, a format that is of interest primarily to CDTV developers.

I presume that many AD1012 users will ultimately use their 12-bit boards to generate eight-bit samples for stand-alone Amiga applications. To test this 12-bit board's eight-bit advantage (if any), I sampled part of a compact disc into a 16-bit AD1012 sample, saved it in IFF 8SVX format, and compared it to the same CD passage sampled in native IFF 8SVX format using Oxxi/Aegis' SoundMaster sampler. Although the AD1012-created sample was a bit smoother, I found the difference negligible. So, if you need only eight-bit sampling (or you need stereo eight-bit sampling), you may want to stick with a more affordable external sampler. On the other hand, the AD1012's internal design makes it more convenient to use, and, as a minor plus, it doesn't hog the parallel port.

Echoing to the Future

SunRize's AD1012 is only the first sortie in the attack of the hi-res samplers. The company will follow the AD1012 with two full-fledged 16-bit digital-audio cards (see the accompanying box, "SunRize Sampler Update," for more details). In addition, SunRize also has announced that the Bars&Pipes MIDI sequencers from The Blue Ribbon SoundWorks will be supporting the AD1012, AD516, and AD1016—allowing musicians to access hard-disk samples as a MIDI channel and combine digital-audio playback with MIDI sequences.

Another manufacturer, ***Beta Unlimited*** of Brooklyn, New York, has announced its **AudioLink** 16-bit audio sampler (the prospect is that it will be released in the not too distant future). This three-part system is slated to incorporate an internal interface card, an external, rack-mountable stereo analog-to-digital converter, and sample-editing software. Its prerelease specs indicate that it will support 16 simultaneous voices, sampling rates up to 96K sps in mono, and up to 16MB of onboard RAM, as well as provide a MIDI port, a slot for a direct-to-disk interface card, and fully digital I/O ports.

The bottom line on this new generation of samplers is that these boards will carry price tags nearly as imposing as their performance. That, however, is the price of audio excellence. Come to think of it, even the sound of money happily leaving a wallet can now be sampled more clearly thanks to these imposing new additions to the Amiga's audio arsenal. ■

Bob Lindstrom is a professional conductor/composer who has created scores for stage and (computer) screen. He was Editor in Chief of Computer Shopper Magazine *and currently is Director of Creative Development for Dynamix, Inc. Write to him c/o* AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458.*

Be Bach In a Moment?

MUSIC-MAKING FOR THE NONMUSICIAN

No, we can't turn you into a maestro overnight, but you don't have to be one to use the programs presented here to create—or even learn—music with your Amiga.



A LOVELY LITTLE melody runs through your head—for no apparent reason. The rhythm of walking down the street starts a snappy funk tune coursing through your veins. A picture-postcard sunset makes you want to sing, so you do. Having had one of these musical experiences, maybe you would like to record the result, set it down so you could listen to it later. Or perhaps you want to use it to accompany some image you've created or incorporate it as part of an animation or video you're working on.

Trying to re-create music that you have "felt" or "thought" can be a most confounding task, even if you have musical experience. If you're a novice, or think of yourself as "not musical," it is an exercise in futility. Don't give up, though, help is just around the corner of your keyboard.

For those with some musical talent, there are quite a few composition programs, sequencers, on the market that allow the user to enter notes, shape phrases, and control playback using the Amiga's internal sounds and/or external synthesizers. But, as stated, these require some degree of musical facility because they are all based on the traditional way of composing by entering notes and rhythms sequentially. (For more information on these, see "MIDI Sequencers," Dec. '90, p 43.)

In this article, however, we will take a look at a number of programs that provide ways for nonmusicians to learn about and to make music in nonsequential, nontraditional ways. Some of these programs may also prove welcome additions to any musician's toolbox.

Music is a language like any other, with grammar, syntax, ►

By Micheal Hanish

vocabulary, and idioms. The "rules" of musical language are basically a set of commonly agreed-upon conventions and traditions, a list of what works to create a particular kind of sound or emotional effect. What is permissible is what the composer can get away with—whatever works to create the desired mood, effect, image, or movement. But rules, as they say, are made to be broken, and one of the features of many of the following programs is that they allow for the spontaneous creation of music, making possible the kind of happy accidents of improvisation that give birth to new ideas. *(To locate vendors of the products described, see the "Manufacturers'/Distributors' Addresses" list on p. 106.)*

"Miraculous" Results

For starters (in more ways than one), consider the **Miracle Piano Teaching System** ($479.95, ***Software Toolworks***). The Miracle is a hardware/software-based keyboard teaching system that includes a midsize, MIDI-compatible, multitimbral (capable of producing more than one voice at a time) keyboard. Worth the purchase price alone, the keyboard sports velocity-sensitive keys (the harder the key is struck, the louder the note plays) and boasts decent built-in speakers. It connects to the Amiga's serial port with a special cable. The Amiga controls the keyboard and runs the interactive teaching software. The entire setup should have an absolute beginner playing a tune at the keyboard inside of ten minutes.



Figure 1. The Miracle's graphic interface is a "house of many rooms."

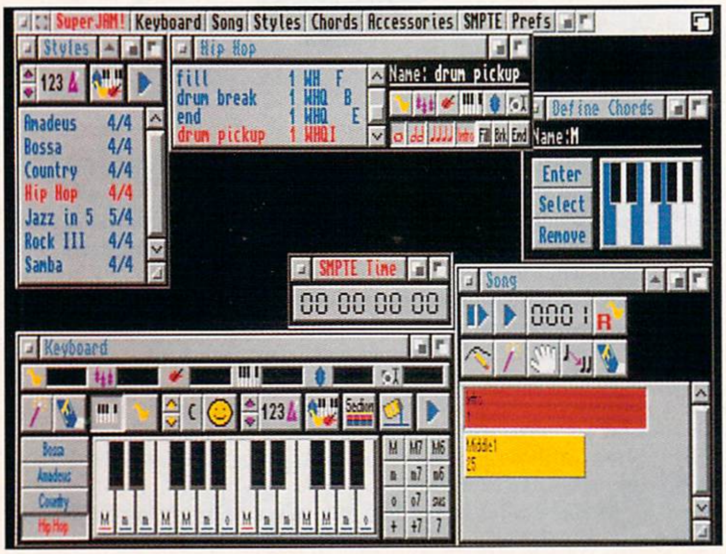


Figure 2. In SuperJam!, you proceed with your editing in a colorfully graphic environment.

The teaching system is both fun and a solid implementation of all the best interactive teaching principles. Not only does the user learn what keys correspond to what pitches, but he or she learns to play tunes by imitating the keyboard as it played by the software. There is constant help and reinforcement from the program; in addition, hypertext linkages take the student to more information about music history or theory (rhythm, chord structures, harmony, and so on). While the progression of lessons is predetermined, the program adapts pace, practice, and detail work to each student, based on a continuing analysis of his or her past work.

The Miracle's software is a house of many rooms: the classroom (for lessons), the administration room (to monitor progress), the practice room (guided practice on material related to the current lesson), the arcade (three arcade-style games for still more practice with the lesson material), the performance hall (play the lesson piece with accompaniment), and the studio (a simplified, multitrack sequence recorder).

You can even export studio-recorded sequences to Bars&Pipes ($199, Professional—$379, The Blue Ribbon SoundWorks) for further experimentation and/or editing. All modules are designed to complement each other in the overall educational scheme. Technical support, just a toll-free phone call away, is excellent. This is far and away the best computer-based music-teaching system I have seen.

Super "Jam" Sessions

If you want to jump right into music-making, I would advise that you investigate **SuperJam!** ($149, ***The Blue Ribbon SoundWorks***) for some experiments in improvisation. This many-layered program puts you in charge of a six-player band that will jam the night away using internal sounds, MIDI synthesizers, or both. Each player (drums, bass, piano, guitar, strings, and lead) is told what to play and how to play it by "styles," the smallest musical building blocks of the program. A style is basically a short pattern that once assigned can be varied interactively (on the fly), automatically, or in combination.

The program comes with a wealth of preset styles that can, in turn, be played in other styles. Users can, of course, also define new styles. With the aid of an excellent manual, you can explore how styles and chords are constructed—thereby learning much about the structure of music.

You can assign the players any sound to realize their parts; the labels are merely for organizational convenience. Each style part and variation series forms a section of the song. Sections can be defined by length, arrangement (who plays in which measures), tempo, volume, chords, and dynamics. All editing is done in a colorfully graphic environment. ►



Circle 62 on Reader Service card.

The song will play somewhat differently every time; once you find a set of changes you like, they can be permanently saved as a snapshot. This feature writes the song to a file that can be replayed exactly the same way every time. Song files can be exported as standard MIDI files for further editing in a separate sequencer. SuperJam! can also run as an accessory from within the Bars&Pipes Professional environment, integrating improvisational and compositional work styles. There is a full-featured set of ARexx commands available, making external control and synchronization possible.

SuperJam! uses "TurboSound Technology" to produce very high-quality samples and song recordings with low processor and memory demands. This technology has also enabled the developers of the program to break the four-voice limit for internal sounds that the Amiga's hardware imposes. With TurboSounds, you can record an entire song performance for playback outside the program. The manual likens this process to that of ray tracing a designed object.

While SuperJam! is a deep and complex program, it is structured in such a way that musical novices can produce satisfying compositions almost immediately. As they delve deeper into the program, more levels of control and variation will become accessible. Users with more musical experience will quickly be able to generate fully formed pieces, discovering variations and surprisingly unexpected changes.

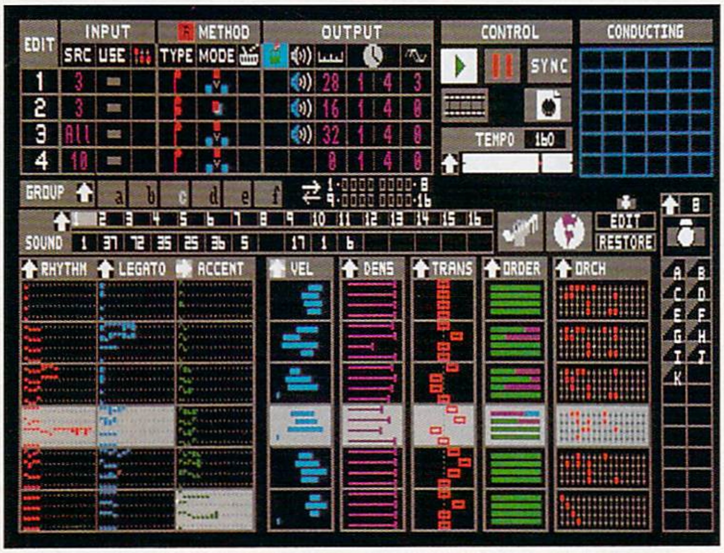


Figure 3. M allows you to manipulate a wide range of musical variables from its control screen.

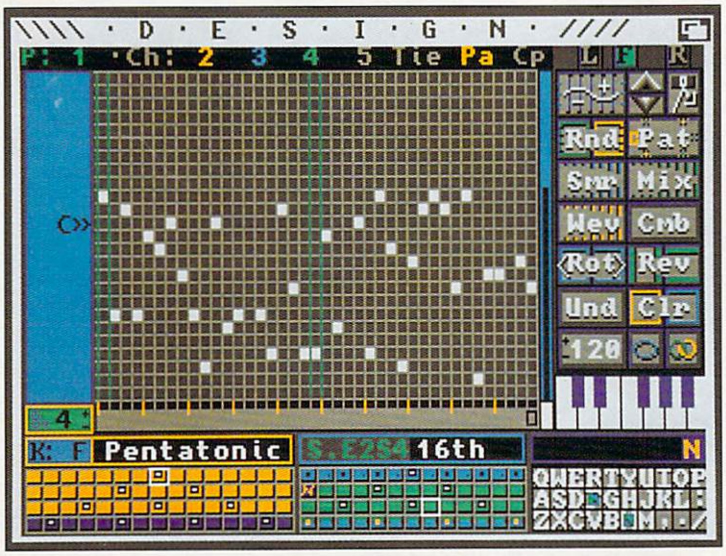


Figure 4. In Hyperchord, musical phrases, called "riffs," can be played into the program in real time and drawn on a grid on the control screen.

Dial "M"—for Music Making!

For a totally open, improvisational environment, try **M** ($179, ***Dr. T's Music Software***). It enables up to four independent parts to play simultaneously, using internal sounds, external MIDI synthesizers, or both. From one graphic screen, the user controls all aspects of these four lines in real time as the piece plays—producing variations in pitch (transposition and note order), duration, volume (velocity), note density, orchestration (what voices play which parts), rhythm, legato (hard or soft articulation), and accent patterns.

You can preset up to six groups of variation patterns for each variable and then flip through them as the piece plays, altering any or all of them on the fly. Even a simple set of pitches such as "Happy Birthday" can yield a surprisingly complex and ever-changing piece of music.

"Playing" M (for it is really an interactive performance instrument) requires an understanding of what the variables represent. Novices, however, can familiarize themselves with their meanings by following the manual's excellent tutorials.

A user could get lost rather easily among all the combinations possible with these variables; fortunately, snapshots (up to 26 of them) save groups of presets for instant recall. This provides a good way of returning to a "home base" of predictable results, or of changing several sets of variables at once. Another method of effecting multiple changes is by "conducting." Using this feature, you can flip through selected groups of variables via mouse movements.

The entire performance can be recorded as a "movie" and saved as a standard MIDI file for export to a sequence-editing program. The music M generates is constantly surprising and inspiring; achieving predictable results takes some practice, but it is absolutely worth the time.

Flashy "Riffs"

Hyperchord 2.0 ($159, ***Hologramophone Research***) is conceptually similar to M, but radically different in operation. The two start from the same premise, namely, that short musical phrases can be varied and combined to make more complex pieces. Hyperchord calls these phrases "riffs" and allows for recording up to 30 of them. These are then assigned to letter keys on the Amiga's keyboard for playback.

Riffs can be played into the program in real time, drawn onto a grid, or they can be generated automatically. Once they are created, you can perform all sorts of operations on them for further transformations. In addition, you can accomplish quite a few of these op- ►

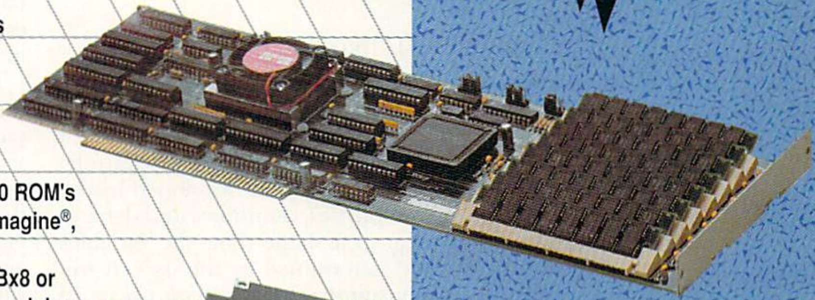
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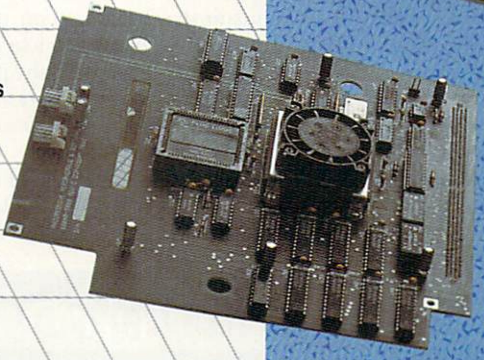
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erations (transposition, rhythmic and harmonic alteration, mixing, and so forth) while the music is playing.

Riffs can be set to play in a user-defined sequence or triggered manually. Playback is done with internal sounds, MIDI equipment, or both. You can save the compositions as standard MIDI files.

Hyperchord can be used at many levels of complexity; it draws the user in for exploration and learning. At first, users will no doubt find the controls somewhat confusing, but the overall musical design of the program, reflected in the graphic control screen, emphasizes common sense and clear logic. Using the program quickly becomes intuitive.

Hyperchord is both a musical generator and transformer, and its workings and style will seem familiar to graphics practitioners. Performing operations on musical material with this program is very similar to performing operations with an image-processing program. In fact, you can create, shape, nudge, and re-create both the basic material and overall form of a composition in much the same way as a painter or sculptor might do with a visual, tangible piece of art.

...And Some Final "Notes"

If you wish to experiment a bit with some alternative methods of composition without committing to the expense of one of the programs discussed so far, take a look at **AlgoRhythms** (Fred Fish #356), freeware by Thomas Janzen. This program was developed by the composer to generate pitches, durations, and dynamics, and to play them in a shape (how the variables change and interact) determined by the user. It will play indefinitely, constantly changing, on up to 16 MIDI channels. You cannot, however, use internal sounds with AlgoRhythms. While not a flashy program, it is very useful for investigating the creation of randomized music, and it produces consistently surprising and often complex textures.

Another useful tool for your music arsenal is **Music Mouse** ($79, ***Dr. T's Music Software***). Written by Laurie Spiegel, this program turns your Amiga into an interactive performance instrument, controlling up to four MIDI voices or four internal sounds. Using menus or keyboard shortcuts, you define what voices will play and how they will sound, how the voices will move in relation to each other (parallel/contrary), harmony and chord types, tempo, transposition, and articulation. In addition, you can alter and vary all of these while the piece is playing.

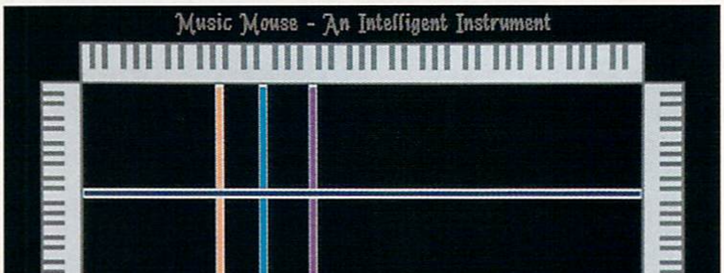


Figure 5. Music Mouse translates the coordinates of points on the screen into notes, which then change as you move the mouse.

"Performing" with Music Mouse involves, as the name implies, the simple act of moving the mouse. Each point on the monitor is the intersection of the four keyboards surrounding the control screen; the control parameter settings determine how the program translates these coordinates into notes. Move the mouse and you trigger new notes; keep it still and the notes sustain or fade away.

The program allows you to record a performance, but only by multitasking with Electronic Arts' Deluxe Music Construction Set or Mimetics' aged and quirky SoundScape. Both methods work, but not smoothly. Music Mouse really excels at being a real-time improvisational music maker. The manual is quite lucid and has many insightful things to say about listening to and creating music. All in all, the program is a sensitive, but in some ways limited, music-making tool.

For a completely different approach to music making, take a look at **Pixound** ($99, ***Hologramophone Research***). This unique program "plays" any graphic screen by translating color values, pixel by pixel, into musical notes, chords, and rhythms. Screens can be either predesigned (in an external paint program) or generated by the program. Output is with four voices, either MIDI or internal sounds. You can preset many variables, including key, harmony, tempo, scale, and chord set, for the program to use in its interpretations, but you can also change them as the resulting music plays. You can save performances as standard MIDI files for replay, editing, and export.

Pixound can play the graphic in a number of ways. Autoplay mode causes a BOB (blitter object) to move across the screen, either randomly from right to left or top to bottom, or along a user-defined path at a controlled speed. If you so desire, you can also bob and weave the mouse pointer on your own. This program is considerably more than a mere novelty item. You can create some beautiful and expressive music while exploring the colors and shapes of pictures, and you can create graphics that in turn create particular kinds of music.

All of the programs we have been looking at have at least one thing in common. They all provide ways of making music without requiring the user to have a highly developed playing technique. They also force the user to think differently about playing and making music. Music is a multidimensional thing. It has depth, texture, association, surprise (even to the creator); it doesn't just move from start to finish like a straight line. If the music is in your heart, grab hold of one of these programs and play on! ■

Michael Hanish uses an Amiga for video, graphics, and music with both his performance group and his adult literacy students. He writes frequently for AmigaWorld *on multimedia subjects. Write to him c/o* AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458.*



Anatomy of a MIDI *Studio*

So you want to improve upon your Amiga's standard sound capabilities? Here are the basics you should know—along with equipment recommendations—for building any kind of sound studio, from recreational to professional.

By Steve Quinzi

Figuring out that you need a MIDI studio is simple. You realize one day that while the Amiga's native sound output is sufficient for voice reproduction and simple music, it does not provide the depth you require for more complex sound. But complex sound involves complex equipment, and understanding components is not so easy. So let's take a look at all the parts of a MIDI studio, find out you what you need, consider prices, and explore some sample setups. (To learn what the MIDI standard is and how it works, see the sidebar "The Meaning of MIDI.")

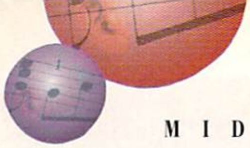
To begin with, define your goals. What do you expect to do with your MIDI studio? Will you use it solely as a "sketch pad" for ideas, or will you produce complete projects? Will you use it for preproduction—to prepare for sessions at an outside recording studio? Will you work on a professional, semiprofessional, or purely recreational level? These factors are important; you want to equip youself adequately without spending money unnecessarily. (For sample setups see the the sidebar "And a One, Two, Three, Four.")

Do not buy anything until you have researched it thoroughly. Check past and future Amiga publications for Amiga-specific music products, and industry publications such as *Electronic Musician* for keyboards, recorders, and other music gear. For information on particular equipment, you can write the manufacturer to request literature or call the company's customer-service department for details. For a hands-on test of equipment, visit your local music store.

Many stores give discounts for large purchases. Buying through mail order can also save you money, but do not do your research at a local store and then buy through mail order—this is just not fair. *(To locate vendors of the products mentioned in this article, see the "Manufacturers'/Distributors' Addresses" list on p. 106.)*

From the Top

Imagine a factory divided into different departments—some larger and more complex than others, but each performing a task vital to the production of the final product. You can think of a MIDI studio in ►



the same way—with some components complex and expensive and others simpler, yet each one a key to producing your music. The beauty of such a modular system is that it is easy to upgrade—you can start small, then as your needs or funds increase, you can add or replace pieces.

The command and control center of the system is, of course, your Amiga. While a souped-up machine works faster, a standard 68000 processor is sufficient for most MIDI purposes.

RAM requirements vary according to the software you plan to run. For basic sequencing, 1MB will do; if you expect to multitask programs, you need at least 2MB (more is better).

For software, choose a good sequencer (see "MIDI Sequencers," Dec. '90, p. 43 for details). Actually the only true software necessity, a sequencer is important because it dictates how your music is put together. ***Dr. T's Music Software***'s **KCS 3.5** ($400) and ***The Blue Ribbon SoundWorks***' **Bars&Pipes Professional** ($379) are the most capable. I also recommend a universal patch editor/librarian, such as **MIDIQuest** ($250, ***Sound Quest***) or **XOR** ($325, ***Dr.T's***). Such a program lets you conveniently store and edit your sounds and setups, and can help you get organized—even if your setup is small.

If you plan to digitize sounds, you also need a sample-capture and -edit program and an audio digitizer. ***Oxxi***'s **AudioMaster 4** editing software ($99.95) and ***SunRize Industries***' **Perfect Sound 3** digitizer ($99.95) make a good combination. If you have a nonAmiga-specific sampler, take a look at **MIDI Sample Wrench** ($279, ***dissidents***), a powerful editor for both MIDI and Amiga samples.

Those interested in sound design may also want **Synthia Professional** ($395, ***The Other Guys***), a sort of software synthesizer that generates waveforms you can load into samplers.

Every setup requires a MIDI interface, which connects to the Amiga's serial port. Standard interfaces are all pretty much the same, although one with a pass-through connector will save you from having to unplug it every time you use your external modem. The Blue Ribbon SoundWorks has just introduced an interface with three separately addressable MIDI ports—a powerful development for the Amiga. (So far, the second and third ports are accessible only through Blue Ribbon's software.)

"KEY" COMPONENTS

Your method of data entry will be via a controller keyboard. Although the term has come to mean any keyboard that sends MIDI data, strictly speaking a controller keyboard is one without sound-producing capability. Nonsound-producing models can better send and manipulate MIDI information and can devote more emphasis to the action of the keyboard. I recommend ***Cheetah***'s **MS7P** ($1425), ***Roland***'s **A80** ($2795), and ***Peavey***'s **DPM C8** ($1995). To varying de- ►

The Meaning of MIDI

SINCE ITS BIRTH in the early 1980s, MIDI (Musical Instrument Digital Interface) has become an integral part of contemporary music production. It is a system by which electronic instruments, recording gear, and computers can communicate for the purpose of recording and performing music. Devices are connected by MIDI cables equipped with five-pin DIN plugs (although only three of the pins are currently used), and MIDI information is transmitted serially at a baud rate of 31,500 bits per second on 16 separate channels.

Every note on a MIDI keyboard is assigned a note number. Playing one of these notes sends four pieces of MIDI information: the note number, note on (telling that a key was pressed), note off (denoting that a key was released), and velocity (the speed at which the key was depressed). In addition, you can send data relating to pitch bend, program change, mono- or polyphonic aftertouch (the amount of pressure applied to the key after the initial depression), modulation, or any of 128 continuous controllers. These controllers are ordinarily used to govern performance parameters. Most, like MIDI volume (controller #7), have a value range of 0 to 127; others, such as sustain (controller #64), are either on or off.

System Exclusive (sys/ex) is a mechanism for transmitting MIDI data that is exclusive to a particular device. Patch librarians rely on sys/ex to send and receive patch data.

Timing-based MIDI devices such as sequencers and drum machines can be synchronized via MIDI clock, which is based on a 24 clock-per-quarter note subdivision. To sync two machines, you must designate one as master (which sends MIDI clock) and the other as slave.

MIDI song pointer, also sent from the master, lets the slave find a location in the song even if you fast-forward or rewind.

MIDI time code (MTC), a slightly more recent development, is essentially a MIDI version of SMPTE (a time code developed by the Society of Motion Picture and Television Engineers for synchronizing audio and video machines). This allows sequencers to sync either to audio or video tape.

MIDI sample dump allows samples (digitized audio waveforms) to be transmitted through MIDI. Due to its large file size, however, this can be a slow process. Sequential Circuits, the now-defunct synth manufacturer, pioneered the use of double-speed transmission for sample dumps and used it in samplers (this feature is supported even by MIDI Sample Wrench). Unfortunately, this technique never caught on with other manufacturers.

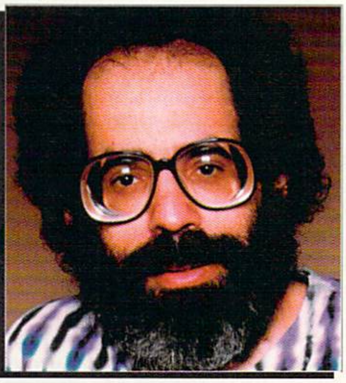
The newest refinement of MIDI is the GS specification, which attempts to standardize MIDI channel, note number, and patch assignments. In the GS spec, for example, piano is always on MIDI channel 1, bass on channel 2, and drums on 10. Musical components are also standardized by reserving channel 4 for melody, 6 for submelody, and so forth. All drum-note assignments are standardized, as are patch locations (programs 1 through 8 are reserved for piano sounds, 9 through 16 for chromatic percussion, 17 through 24 for organ, and so on).

To keep up on MIDI developments, check out the MIDI boards on GEnie, CompuServe, and PAN (the Performing Artists Network; 215/584-0300, voice). *—SQ* □

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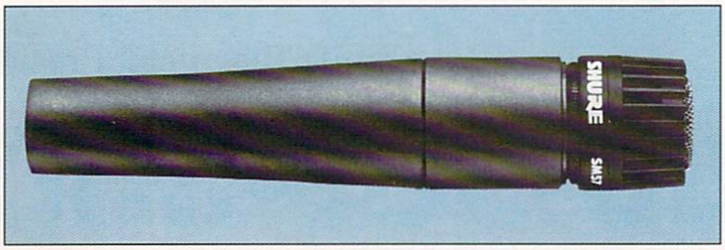
Circle 17 on Reader Service card.

grees, they all let you assign multiple zones (with each zone able to send note data and controllers on different MIDI channels) and scale outgoing data velocity to suit your style. They also offer such features as assignable sliders for sending continuous controllers, MIDI filtering, processing, mapping, and merging, together with 88 weighted keys and piano-like action.

Though a nonsound-producing keyboard is wonderfully powerful, some may see it as an expensive luxury: To the cost of the keyboard itself, you must add the price of a sound module. Besides, many MIDI-manipulating features of controller keyboards may be duplicated on your sequencer. A MIDI keyboard that produces sound is more cost effective. If you need an 88-note keyboard, you can choose ***Kurzwiel***'s **K1200** ($3195), which provides weighted synth action, or ***Korg***'s expensive **T1** ($5669), which offers piano-like action. Both are "workstations," meaning that they provide on-board sequencers—a redundancy that I would ordinarily recommend avoiding.

A 76-note keyboard is a good compromise, and in this category I recommend ***Roland***'s **D70**. Still somewhat pricey in the $2000 range, its semiweighted synth keyboard feels good. Though not as powerful as the dedicated controllers, these sound-producing keyboards have a good complement of controller functions that suffice in all but the most esoteric situations.

If you can live with a 61-note keyboard, your choices are significantly greater. For example, the very effective ***Kawai*** **K4** and ***Peavey*** **DPM2** go for $1445 and $1295, respectively. For under $1000, you can get ***Roland***'s **U20** (a scaled-down D70 for around $895) and ***Kawai***'s **K1 II** ($750). Recently, I have seen both ***Roland***'s **D5** and ***Casio***'s surprisingly powerful **VZ10** at mail-order closeout prices in the $600–$700 range.



You can sing along economically with Shure's SM57.



Mix it up with a Mackie mixer.

"Sound" Options

If you opt for a sound-producing controller, the keyboard itself is a sound source. Like most new keyboards, those mentioned above are multitimbral, meaning that they can play more than one sound at a time. (To take advantage of this, assign each instrument to a different MIDI channel—bass on channel 1, piano on 2, for example—and program the appropriate parts on your sequencer.) The number of simultaneous timbres can be four to 16, depending on the instrument, but is limited by the polyphony of the instrument. A sound source that has 16-voice polyphony is limited to 16 simultaneous notes, no matter how many timbres are possible. Some instruments have greater polyphony, such as the D70 with 30 voices.

If you want more sound—or if you choose a nonsound-producing controller—you need one or more keyboardless sound modules. Myriad rack-mountable modules exist; nearly every keyboard manufactured today has a module counterpart. Two popular ones are ***EMU***'s **Proteus** and ***Korg***'s **M3R**, both of which sell for $800–$900. ***Roland***'s **Sound Canvas** conforms to the MIDI GS format and sells for around $650.

All sound sources fall into two basic categories: sample players and synthesizers. Some units in the latter category combine elements from various synthesis techniques to arrive at a unique sound. In choosing sound sources, look for units that lend themselves readily to the style of music you usually play. If you write orchestral music, for example, you might consider Kurzweil's K1200 keyboard and EMU's Proteus II module, instruments that specialize in acoustic and orchestral sounds. If electronic sounds are your cup of tea, Casio's VZ10 and a couple of **Matrix 1000** modules (monotimbral analog synthesizers from ***Oberheim***) might be right. For pop music, you need the basic staple of commercial sounds found on most contemporary keyboards and modules.

Although drum sounds are included with many sound sources, it is often better to use a dedicated drum module. These units generally provide a greater selection of sounds and features that are specific to drum programming. ***Roland***'s **R8m** is my favorite; ***Alesis***'s **D4** is also good.

The most versatile sound source is the sampler, or audio digitizer. The mockingbird of modules, it can imitate any sound by recording and playing it back. A sampler can help you in many ways: If you have only one Matrix 1000, for example, but need two, you can digitize some of the module's sounds and then use these samples just as you use the originals.

A sampler is also useful for sound effects; instead of the old method of "flying in" (recording) effects onto audio tape, you can sample all the effects you need, assign them to different MIDI note numbers, and trigger them from your controller while recording the "hits" with your sequencer. For vocals, digitizing repetitive parts and laying them in with a sampler is much easier than singing them over and over.

The most obvious choice for a sampler is your Amiga. Using an audio-digitizing product, you can sample

sounds at a resolution of eight bits and play them back with four-voice polyphony. If you have an accelerated Amiga, The Blue Ribbon SoundWorks has devised a way to squeeze 16 voices out of the Amiga simultaneously. This is infinitely more musical, but eight-bit IFF samples are of relatively low fidelity compared to the output of dedicated 16-bit samplers. If you are on a tight budget or if you do not require state-of-the-art audio quality, use the Amiga for sampling. Otherwise, buy a 12- or 16-bit sampler card for your A2000 (see "Sampling the Future of Sound," p. 26), or relegate it to an auxilliary sound source for layering sounds and sound effects.

Of the 16-bit dedicated samplers, ***Akai***'s **S1000** seems to have emerged as the high-end favorite. Selling for about $3500, including a 40MB hard drive, it is a great-sounding stereo sampler, with such powerful features as time compression (the ability to change a sample's length without altering its pitch, and vice versa). On the low end is ***Peavey***'s new **SX** and **SP** combination ($1400 total), two separate units that together form a very clean mono sampler.

Take This Route

Few people realize the importance of the MIDI patcher, but it is a necessary device in any MIDI studio. It usually comes in the form of a single-space rack unit. On the back panel are eight MIDI-in and eight MIDI-out jacks into which you plug the MIDI input and output of each device in your setup. Across the front are buttons you can use to assign a specific input to any output. In this way, you can send your controller's output to the computer, then route the computer data to the inputs of your sound-source modules. (If your keyboard is a sound source, disable its local control.)

This is a basic routing that you can store in the patcher's memory and assign a program number. In using a universal patch librarian, you need a separate program for each module. Here, the module's output is routed to the Amiga's input, its input goes to the Amiga's output, and all other routings are off. The librarian can thus communicate with each module separately, and if you have done the proper set-up work, all routing changes will be automatic.

Most MIDI patchers cost $200–$350 and provide basic routing functions only. Others, like ***JL Cooper***'s **MSB+**, also offer merging and processing. You may see ads for switch boxes that have two inputs and eight or so outputs, but these are not appropriate—you need a programmable eight-in by eight-out patcher that responds to program change. I recommend either ***360 Systems***' basic **8×8** unit or the JL Cooper box. (Avoid Roland's A880; it has hidden problems that make it unsuitable for MIDI studios.) If you end up with more than eight MIDI devices, **KMX** makes a **16×16** patcher, and ***JL Cooper*** makes a **16×20**.

No matter how many devices you have leading in and out of your patcher, your MIDI setup is incomplete without a means for listening to the music. Your home-stereo system is an option, though it is a poor choice from an audio standpoint. Even if you do use it, however, you need a mixer to handle output from your sound sources.

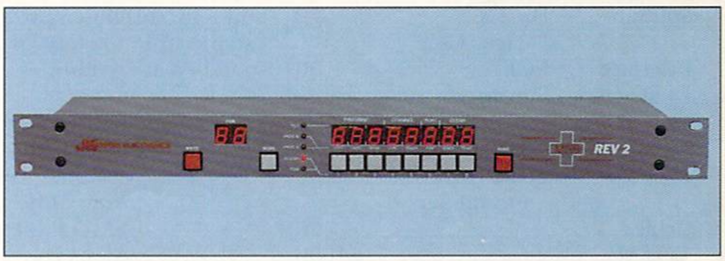
If you have only one or two sound sources, a four- or six-channel mixer will do. If your setup is or may become more extensive, think about a 12- or 16-channel mixer to accommodate growth. ***Mackie***'s **12-** and **16-channel mixers** are very good buys at $399 and $1099, respectively, with impressive specs and features.

The final links in the chain are a good hi-fidelity amplifier and a pair of near-field, studio-monitor speakers. Studio monitors differ from home-stereo speakers in that they are designed to reproduce sound as it really is, rather than make it more pleasing. This is critical—if your music sounds bad, you should know it! ***Yamaha***'s **NS 10M** studio monitors are the standard for near-field monitoring in professional settings, while the less expensive ***JBL*** **Control 1s** are popular in small studios.

If you sing or play an acoustic instrument, you may want to record live tracks in addition to your sequenced tracks. For this you need a multitrack recorder. For home studios, I recommend one of the four- or eight-track cassette "ministudios" by Tascam or Fostex. They sound remarkably good, are fairly inexpensive, and have built-in mixers for tape tracks. Some have enough inputs to handle your sound sources so that you may be able to get by without another mixer.

To synchronize recorded live tracks with Amiga-generated sequenced tracks, you also need a SMPTE generator/reader. (There are other means, but because SMPTE technology is so affordable, the alternatives make no sense.) If you use KCS or Bars&Pipes Professional, ***Dr.T's***' **Phantom** ($350) is a good choice. Otherwise, you can use a SMPTE box such as ***JL Cooper***'s **PPS 100** to lock up via MIDI time code or song pointer.

The procedure is first to record ("stripe") time code onto one of the audio tape tracks (preferably an outside track) from the SMPTE generator, and then to feed the audio output from that track back to the SMPTE reader. The reader reads the time code and in turn sends either SMPTE, MTC (MIDI Time Code), or MIDI song pointer to the sequencer, which then syncs with the tape. With this technique (called virtual tracking), you ►



JL Cooper's MSB+ patcher gives you extra features.



Press here: A Peavy keyboard.

never have to record sequenced tracks onto the multitrack (audio) tape; instead, you can leave your tape tracks free for vocals and live instruments. For live recording, you need some other things, including a microphone. A good general-purpose mike is ***Shure***'s **SM57** ($129), but if you are serious about audio quality, ***AKG***'s **414** (about $1000) makes a big difference.

Because people rarely sing or play at a constant level, a compressor is handy. This device hooks in between the mike and recorder—squashing the dynamic range ►

And a One, Two, Three, Four

EACH OF THE following sample setups is ideal for a specific application. The equipment recommendations are suggestions only, however; in most cases, you can substitute other equipment without lowering the effectiveness of the studio. The figures indicated for MIDI equipment are approximate street prices, not suggested retail. Retail prices are noted, however, for Amiga-spcific products.

1. Scratch Pad

The first setup is a low-cost "scratch pad" with which to experiment and work out ideas. I chose the K1 and the SY33 as sound sources for their tonal variety and low cost. The Amiga is an excellent companion here as an additional sound source for instrumental timbres and sound effects. You can use your stereo for monitoring, and because this is a scratch-pad studio, there is no real need for recording gear.

Controller	Kawai K1 II	$725
Module	Yamaha TG33	425
Software	Dr. T's Tiger Cub	59
Interface	ECE	50
Digitizer	SunRizes' Perfect Sound	99
Editor	Oxxi's AudioMaster	99
Mixer	MIDIman Minimixer	99
Cables		50
TOTAL		$1606

2. General Production

This general production studio is perfect for recording song demos, jingles, and so on. The sound sources provide a full range of solid commercial sounds.

Controller	Roland U20	$895
Modules	EMU Proteus	895
	Alesis D4	400
Interface/ Sync	Dr. T's Phantom	350
Software	Blue Ribbons' Bars&Pipes Pro	379
	Dr. T's XOR	325
Patcher	360 Systems' 8×8	299
Microphone	Shure SM57	129
Effects	Alesis Microverb III	249
Compressor	Alesis	295
Mixer	Fostex 2016 Line Mixer	299
Amplifier	Peavy PMA 70+	299
Monitor speakers	JBL Control 1s	179
Multitrack deck	Tascam 488 (eight track)	1279
Mixdown deck	Tascam 103 cassette	359
Cables		180
TOTAL		$6811

3. Programming Power

A programmer's rig, this studio is designed for the person who programs music and sounds at home but records at an outside recording studio. All of the modules should be mounted in a 19-inch rack. The rack, controller, and computer go with you to the outside studio when you are ready to record, while the mixer, amp, monitors, and deck stay home. The sound sources and software chosen provide the greatest possible variety of sounds and sound-creation tools.

Controller	Roland D70	$1995
Modules	Oberheim Matrix 1000	499
	Korg M3R	829
	EMU Proteus II	1295
	Alesis D4	400
Interface/ sync	Dr. T's Phantom	350
Software	Dr. T's KCS 3.5	400
	Dr. T's XOR	325
	dissidents' MIDI Sample Wrench	279
	The Other Guys' Synthia Pro	395
Sampler	Peavy SX/SP	1350
Patcher	JL Cooper MSB+	349
Mixer	Tascam 1024	1529
Effects	Alesis Microverb III	249
Amplifier	Peavy PMA 70+	299
Monitor speakers	Yamaha NS10Ms	330
Mixdown deck	Tascam 103	359
8-space rack		200
Cables		325
TOTAL		$11,757.

4. Music For Video

This system is for the person who regularly scores to video on a professional level. Here, the video deck's time code is the master timing source. I chose a play-only 3/4-inch video machine (a player/recorder is much more expensive). Any video to be scored should be striped with SMPTE at the video house. The time code from one of the video deck's audio tracks is fed to Dr. T's Phantom, which drives the sequencer.

I chose the DAT for a mixdown deck not only because of its superior sound quality, but also for its stable and accurate transport. In this way, you can take your music (on DAT) back to the video house and, with a little shifting, make it lock up exactly as it did at home.

I selected Korg's Wavestation as a sound source for its abundance of long, cinematic-type sounds that lend themselves well to underscoring.

Controller	Roland U20	$895
Module(s)	EMU Proteus	895
Interface	Korg Wavestation A/D	1899
Interface/ Sync	Dr. T's Phantom	350
Software	Blue Ribbon's Bars&Pipes Pro	379
	Dr. T's XOR	325
Sampler	Peavy SX/SP	1350
Patcher	360 Systems' 8×8	199
Mixer	Mackie Design CR1604	1099
Effects	Alesis Microverb III	249
Amplifier	Peavy PMA 70+	299
Monitor speakers	JBL Control 1s	179
Video deck	Sony VP 5020	1595
Mixdown deck	Technics SV DA-010 DAT	799
Cables		295
TOTAL		$10,807

—SQ □

All photographs are of actual DCTV screens.

DCTV

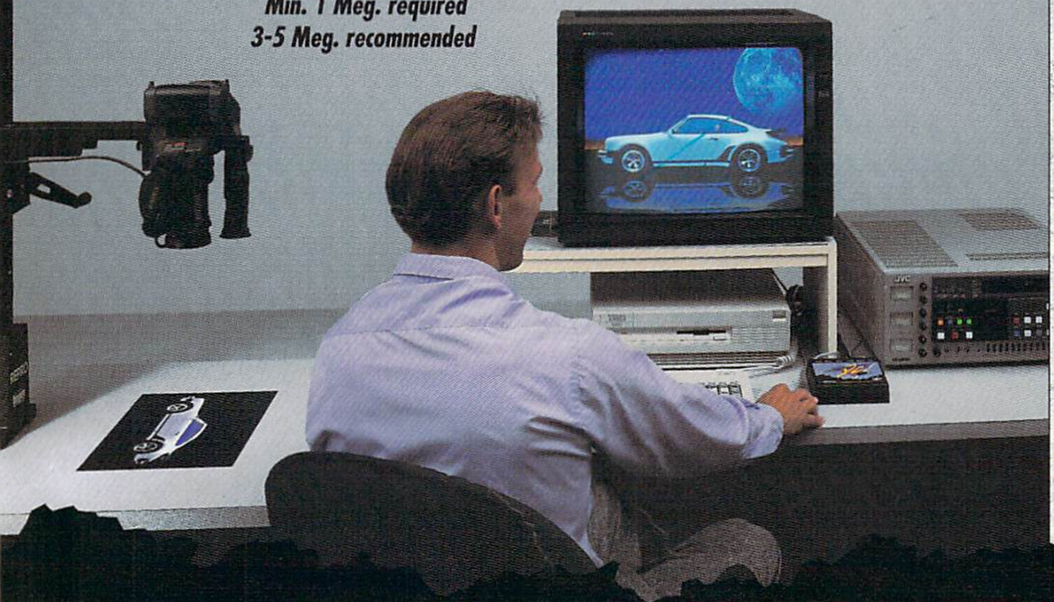
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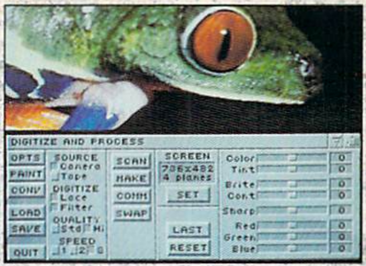
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of whatever signal passes through, keeping the level relatively constant, and avoiding tape overload. Low-cost **stereo compressors** from such companies as ***Alesis*** list for about $300.

While many keyboards and sound modules provide effects (reverb, chorus, digital delay, etc.), some do not; nor does a voice or acoustic instrument. Therefore, you may want an effects unit—something able at least to generate reverb. A good, inexpensive solution is ***Alesis***'s **Microverb III** ($245).

Once you have sequenced your music and recorded the live tracks, you must mix all this down ("master" it) to a medium you can easily distribute and listen to. The least expensive option here is cassette, and the best cassette machine for mastering is a good-quality three-head model (about $350–400). If you demand superior quality, consider a DAT (digital audio tape) recorder; consumer models average $800, and they all sound great. If you want to press CDs directly from masters recorded in your home studio, invest in a professional DAT machine ($1300 and up).

Set Dressing

Once you have bought all your gear, you need to find the best place to set it up. Make sure the room you choose is isolated from such aural distractions as a blaring TV. Your work space should be sonically "dead." To make it so, carpet the floor, remove such reflective surfaces as mirrors and glass-covered pictures, cover windows with heavy curtains, and break up the symmetry of the room by strategically placing padded furniture. Short of soundproofing and acoustically treating your walls, this is about all you can do.

Arrange your gear logically so that everything is accessible, and leave enough room to work comfortably. Place your controller close enough to the Amiga's keyboard so that you can play while using the sequencer. In a rectangular room, facing the speakers down the length of the room will improve your perception of the low frequencies.

Good wiring is essential: Give youself enough electrical outlets and buy surge protectors for all your gear. Run your cables neatly, and label them at both ends in case you need to trace them (stick-on numbers are available at electronics stores for this purpose). For the audio connections, get studio-quality cables. If your set-up is extensive or you are uncomfortable with wiring, consider hiring a technician to custom wire your studio. This is expensive, but it can save a lot of heartache.

With your gear hooked up, you and your Amiga are ready to make beautiful music together. Have fun! ■

Steve Quinzi is musical director for the popular Latin American artist, Chayanne, and a free-lance composer, producer and arranger. He has written many articles concerning music and music products, not only for AmigaWorld, *but also for music-industry publications. Write to him c/o* AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458.*

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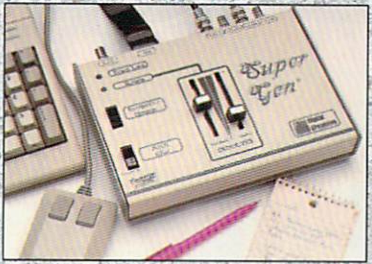


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A Brand-New BENCH

GETTING THE MOST FROM WORKBENCH 2.0—PART I

FOR MORE THAN two years, Amiga 500, 1000, and 2000 owners have been waiting—like a carpenter eager to tear the shrink wrap off a package of Freud tools—for version 2.0 of the operating system. We have listened patiently while A3000 owners told of the wonderful operating environment that the new Kickstart and Workbench provide. We have anticipated the features and programs that promised to make our lives easier. Over and over we have asked, "When will it be available?"

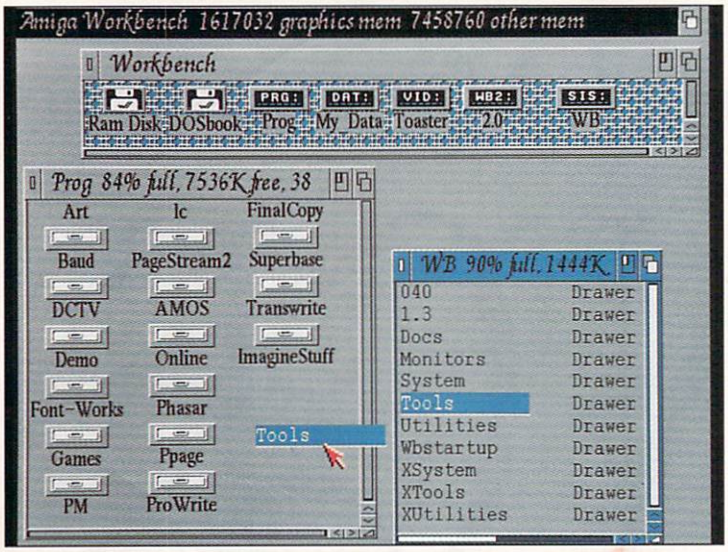
The new Amiga operating system promises outstanding benefits to users of all Amiga systems. In Part I of our workingman's guide to Workbench 2.0, we'll look at its new features—plus different 2.0 upgrade paths.

Finally, the waiting is over. Anticipation has been replaced by a cold hard choice: to stick with 1.3, or to upgrade to 2.0 (or, more precisely, 2.04). Even A3000 owners must make a decision, as the final release improves upon the 2.0 version shipped with their machines. Faced with the cost of the Enhancer Kit, the original question has been replaced by the query, "What's in it for me?"

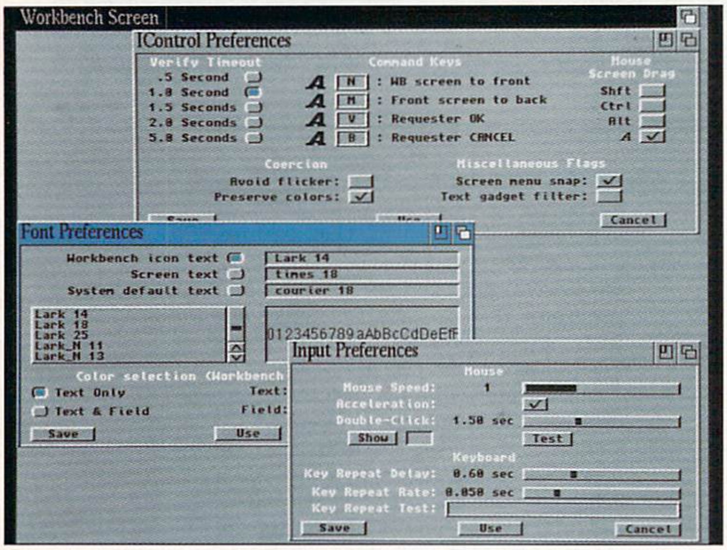
The short answer is "a lot." We are not talking minor revision here—the changes in 2.0 affect nearly every part of the operating system. While many differences are readily apparent, even more lie hidden beneath the surface, waiting for programmers to unleash their power. In the first installment of this two-part series, we'll talk about changes to the Workbench. Also, if you're wondering about the various paths of upgrade (and there are a few), see the sidebar "Making the 'Grade." And don't forget to return next month for Part II of the Workbench 2.0 story, when we will address new features that make third-party applications software more exciting and powerful. ►

By Sheldon Leemon

ILLUSTRATED BY KENNETH McMILLAN



Workbench 2.0 has an embossed look and lets you select fonts for icons, menus and text. You can show a window's contents as text, and you can also size and drag the Workbench window itself.



The new Preferences scheme offers new editors, including an Overscan editor that lets you choose the default screen size.



Looking Good

The first thing you will notice about Workbench 2.0 is its more professional appearance. The old default color scheme has been replaced by a more business-like palette of gray, white, black, and blue. Window borders and gadget buttons have taken on a solid, three-dimensional look, and the gadget imagery has been redesigned for a sleeker look. Workbench icons are now mounted on raised rectangular buttons that give them better definition. You can now easily tell when an icon has been selected: It looks as if the button has been pushed in.

Some appearance changes result from small functional differences. The old "fuel gauge" running along the left side of a Workbench window has been replaced by text in the title bar that indicates how much space is being used and how much remains. The arrows on



a window's scroll bar are now grouped together at one end to make it easier to move back and forth. The two depth-arrangement gadgets have been replaced by a single one that brings the window to the front on the first click, and sends it to the back on the second (or when you shift-click). A new window gadget, the Zoom button, toggles the window size between its current size and an alternative (usually either the maximum or minimum).

A less obvious change is the degree to which you can now customize the appearance of Workbench. One of the first things you will want to do is try the various display options. For example, you can use the Workbench/Backdrop menu item to change the Workbench window from a backdrop window you cannot size or move into the same type of window that disk and drawer icons display. The ability to resize, position, and arrange the Workbench by depth makes it much easier to keep your disk icons visible when many windows are open on the screen.

Other customization options come from the more flexible Preferences system. Under 2.0, the single Preferences program has been replaced by a series of editor programs that reside in the Prefs drawer. Some of these editors, such as those that control serial settings, printer text, printer graphics, pointer shape, and system time, mirror the functions offered by the original Preferences program (though in a more attractive format). Others, however, give you some completely new options.

The WBPattern editor, for example, lets you change the background color of Workbench windows to any solid color or to a distinctive pattern of colors. You can choose from several preset patterns or design your own, and you can set a different pattern for Workbench and drawer windows—making it easy to tell them apart at a glance.

Another much-requested option is the Font Preference tool. This program lets you add virtually any system font to the Workbench. You can select different fonts for Workbench icon text, menu text, and the default font that applications like the CLI and system text editors use. The ability to change fonts is a boon when you are using a 640×400 Workbench screen and need large, readable text.

Speaking of fonts, the new Workbench allows you to create system fonts from Compugraphic outline fonts, like those used in desktop-publishing programs. The advantage of outline fonts over bitmap fonts is that you can scale them smoothly to virtually any size. That means you no longer need to search for a font of just the right height. You can make any of the three included fonts any size you want—and they will work with almost any software that uses Amiga system fonts.

While outline fonts are versatile, they require a big chunk of storage space. Also, the system requires a fair amount of time to scale a font from an outline. For



these reasons, outline fonts will prove most beneficial for those with hard-drive systems, and perhaps accelerators. However, the new Fountain program that appears in the System drawer of the Extras disk can create real Amiga bitmap fonts from the outlines—bitmapped fonts that any Amiga owner can easily use.

A Bigger Bench

With 2.0, you now also have complete control over the Workbench screen's size and graphics mode. The Overscan editor lets you expand your Workbench display out towards the edges of the screen (up to about 720×480 pixels). Although it was possible to display overscan screens under 1.3, the 2.0 software makes this a standard feature for the first time, and the easy visual interface of the Overscan editor makes it a snap to drag your screen to whatever size you desire. By making your display a little wider, it is possible to show 80 columns in a word-processor window and still have room for a scroll bar at the side.

The ScreenMode editor allows you to set the Workbench to any graphics mode that your display chips and monitor support. If your monitor accepts multiple vertical refresh rates (as even most of Commodore's 1084 models do), you can not only select medium or high resolution, but also choose whether you want the display in PAL (the European format that defaults to 640×256 with a 50-Hz refresh rate) or NTSC (the US standard that defaults to a shorter 640×200 screen with a 60-Hz vertical scan). If you have the ECS (Enhanced Chip Set) Denise chip and a multisync or VGA monitor, you can also choose a 1280×200 SuperHires Workbench or noninterlaced 640×400 Productivity mode.

ScreenMode lets you elect to use just two colors on the Workbench screen in order to save memory, or to use up to 16 colors for a jazzier look. It also allows you to set the size of the Workbench screen, from the standard 640×200 to an overscan display whose size is determined by the settings of the Overscan editor. You can even select a scrolling Workbench that is much larger than the visible display. With a 1000×800 Workbench screen, for example, a desktop-publishing program can generate all the graphics for a full page of text at once. Though you still must scroll around to see the whole page, the publishing software does not have to update the display while you scroll, making the action much quicker. ►

Making the 'GRADE

WITH THE VARIETY of Amiga models and their possible configurations, you shouldn't be surprised that there are quite a few different upgrade paths to version 2.0. Most A500 and A2000 owners need only buy the 2.0 Enhancer kit (part number AS214). This $99 package contains a small blue box that holds the 2.0 ROM chip, four disks (Workbench, Extras, Fonts, and Install), and a large binder containing the thousand-page manual, *Using the System Software*, that also comes with the A3000.

All you have to do to install the new Kickstart ROM is remove the old ROM from its socket and plug in the new chip. Getting to the ROM socket, however, requires a fair amount of disassembly work. If you have never opened the cover of your computer before, or if your computer is still within the warranty period, you may want to have your dealer install the chip. Once the ROM is installed, owners of floppy-drive systems need only copy the Workbench and Extras disks. Hard-drive-system owners will have to install the new software on their drives by using the included installation disk.

Amiga 2500 owners, or A2000 owners who have upgraded to either the 2620 or 2630 accelerator card, will have to upgrade the accelerator in order to use it with the 2.0 ROM. For about $40, Commodore sells a set of two replacement ROMs that fit either accelerator.

Amiga 3000 owners already have 2.0, but most do not have the latest version, 2.04. There are two ways to upgrade to this version. You can continue to have your hard drive load Kickstart, which allows you to boot either Kickstart 1.3 or 2.0, but which also consumes 512K of user RAM. If you want to conserve RAM, however, you can buy an upgrade that gives you Kickstart in ROM.

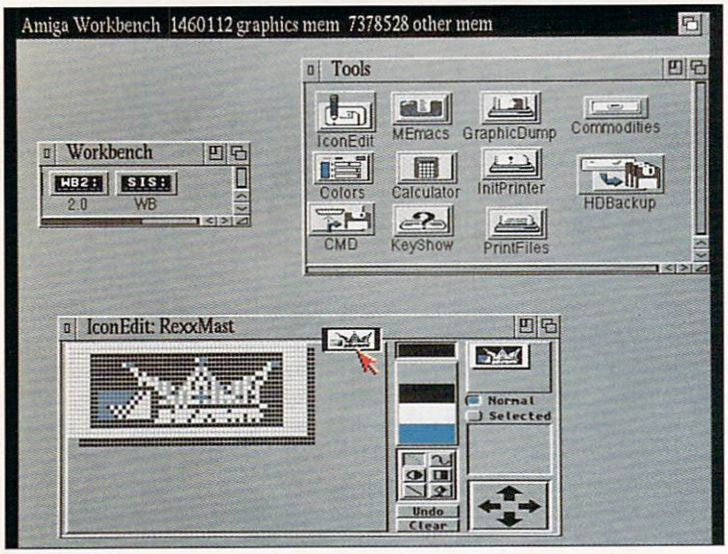
Following the first route, Amiga 3000 owners who registered for Commodore's Gold Service can receive a free five-disk upgrade to version 2.04. Without Gold Service, owners must pay $22.95 for the disk upgrade. Amiga 3000 users who opt for the ROM solution can buy the AS314 ROM upgrade kit, which includes an 80-page manual addendum, for $45. Commodore, however, does not support any method for booting Kickstart 1.3 on a A3000 after 2.0 ROMs have been installed.

What about Amiga 1000 owners? Commodore has not released any disk-based upgrade for the A1000, most likely because the new Kickstart is twice as large as the old one and will not fit in the A1000's Kickstart RAM area. While it is technically possible to fit the overflow into user RAM, that would leave less than 256K of work space in a 512K machine. The best choice for A1000 owners who want to upgrade to 2.0 is to buy a board such as DKB Software's KwikStart II ($99.95) that will let them plug the ROM chip into the machine.

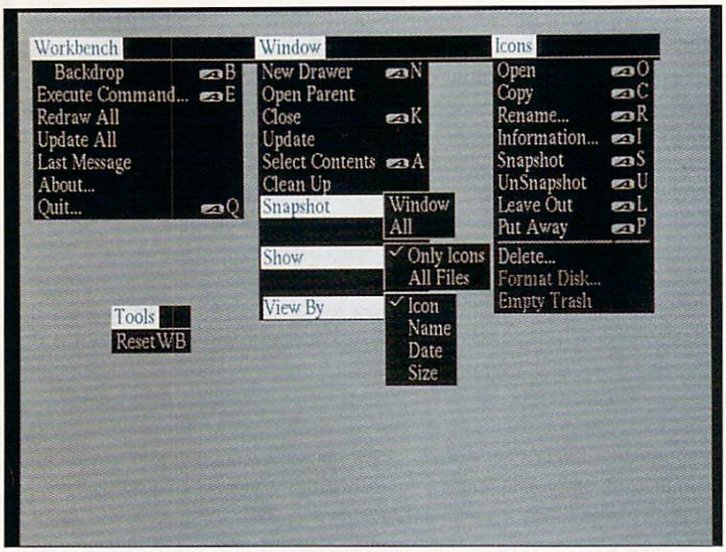
Many users are confused about whether they need the ECS chip set in order to upgrade to 2.0. The answer is a resounding no. The 2.0 ROM will work with any version of the custom chips. All you really stand to gain by having the ECS Agnus and Denise chips is the ability to display the Workbench screen in the new SuperHires (12805400 interlaced) or Productivity (6405480 noninterlaced) modes. These modes are of minor interest, however, as they are supported by very few application programs.

Several display enhancers are available for little more than the $200 cost of ECS upgrade. Because these deinterlace the display in all Amiga modes, they represent a much better solution for those seeking a hires screen without flicker than does the creation of a special new noninterlaced mode. One upgrade you may want to consider, however, is DKB's MegaChip board ($299.95), which lets you plug in an A3000 Agnus chip and get two megabytes of chip RAM on an A2000 or A500. If you use an eight- or sixteen-color Workbench, or a large scrolling Workbench screen, you can go through a lot of chip RAM mighty fast. □

—SL



The Icon editor is representative of 2.0's upgraded tools: It has a host of menu options, and you can load an icon just by dragging it into the window.



The 2.0 menu structure offers lots of new choices, with keyboard equivalents for many of them.



Moving around a virtual Workbench screen is made easier by an autoscroll feature that shifts the display when your pointer moves past the screen's edge. Further, you can drag an oversized screen right and left, as well as up and down—and you no longer have to drag the screen by its title bar. By holding down the screen-drag key (which defaults to the Left Amiga key), you can drag the screen regardless of where the mouse pointer is. Another much-needed refinement to screen management, the Left Amiga/m key combination now cycles through all available screens instead of sending you to the rearmost screen. In addition, you can change both the screen-drag and screen-cycle key designations with the new IControl editor.

The final display option is color-palette selection. The Palette editor is similar in function to the palette portion of the old Preferences programs, but like most new editors, it has some important enhancements. There are several menu options, including nine preset palette choices that are similar to those offered for Microsoft Windows. These presets are quite helpful, because 2.0's 3-D look requires color 1 ("shadow") to be darker than the background, and color 2 ("shine") to be lighter. As with most Preference editors, this one lets you save a number of different palettes, and either load them into the Palette editor or select their settings simply by clicking on a Workbench icon.

Built for Comfort—and Power

The new Workbench is not only more flexible and stylish, but also much more powerful. The most significant change is that it now allows you to view and manipulate all files, whether or not they have associated .info (icon-imagery) files. When you select the Window/Show/All Files menu item, the Workbench creates temporary icons for files and directories that do not already have them. These temporary icons enable you to open, copy, and delete files and directories that you could not even see from the Workbench before.

Temporary icons even enable you to run CLI-only programs from the Workbench. For example, if you make the commands in the Workbench C directory visible with the Show/All Files menu item, you can run such programs as Dir by double-clicking on its temporary icon. This brings up an Execute Command requester that acts as a mini-CLI, allowing you to type command-option text to send to the program. When necessary, the Workbench opens an output window that lets you see the program's text output.

With Workbench 2.0, you do not have to edit a startup-sequence file in order to start a program automatically when you turn on the computer. You need only drag a copy of the program to the WBStartup window; Workbench runs everything in that drawer when it starts.

Workbench 2.0 also includes many new convenience features. The Window/View By menu item lets you view the contents of a directory as a list of names—sorted alphabetically, by date, or by file size—instead of as a collection of icons. You can, however, treat these names as icons, dragging or double-clicking them.

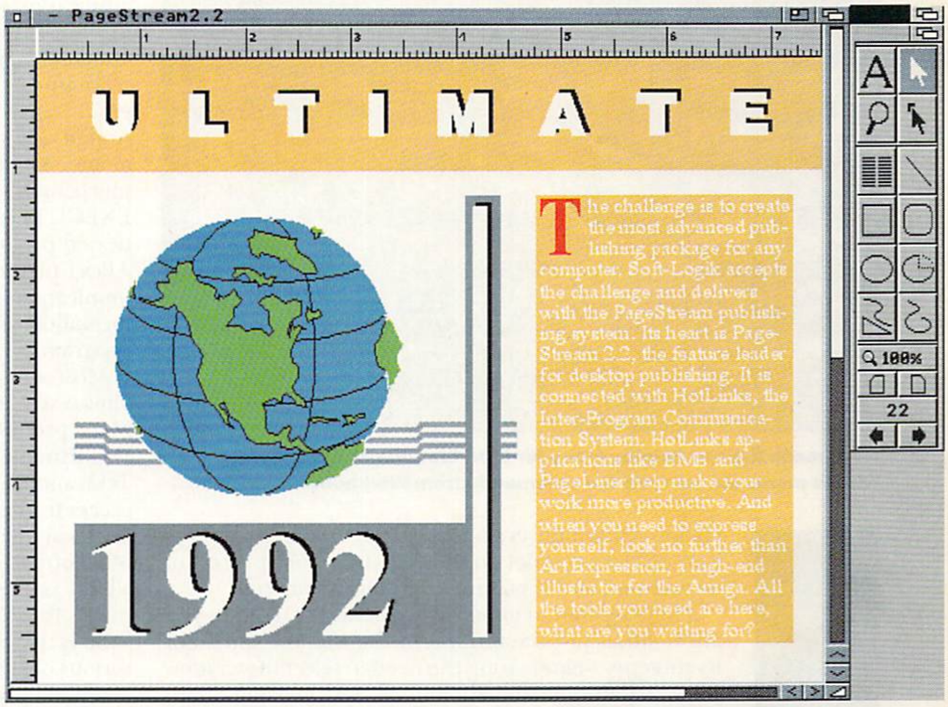
To select several icons at once, you can now highlight them all in a window via the Window/Select Contents menu item. You also can select a group of icons by dragging a box around them with the mouse (move the mouse to the side of an icon, hold down the left button, and as you move the mouse, a selection box appears). You can even deselect a single icon without affecting the whole group: Just position the pointer over the icon, hold down both the left mouse button and the Shift key, and then click the right mouse button. (Clicking the right mouse button while dragging an icon cancels a move or copy operation.)

The new Workbench even multitasks better than the 1.3 version. Launching an application no longer ties up the whole computer until the program loads. Now, the message Attempting To Launch Program "Program Name" appears in the title bar, and you can continue operations while the program is loading. You can also close a window before all the icons are displayed, so a long wait is no longer forced upon you when you accidentally open a disk that has hundreds of icons.

The Window/New Drawer menu item automatically ►

More than Skin Deep.

INTERFACE	ProPage 2.1	PageStream 2.2
AmigaDOS windows	N	Y
AmigaDOS gadgets	N	Y
AmigaDOS scrollbars	N	Y
AmigaDOS file requester	N	Y
ENVIRONMENT		
# of Open Documents	1	**Unlimited**
View Magnifications	7 fixed	**15–1500%**
Variable Zoom	N	Y
Magnifying Glass Tool	N	Y
"No Frames" Text	N	Y
Moveable Toolbox	N	Y
HotLinks Compatible	N	Y
GRAPHICS		
IFF (24 bit)	Y	Y
ProDraw Clip – Editable?	Y / N	Y / Y
Aegis Draw – Editable?	Y / N	Y / Y
IFF DR2D – Editable?	N / N	Y / Y
EPS – TIFF/PICT preview	Y / N	Y / Y
PC: TIFF, GIF, IMG, GEM	N	Y
Mac: Paint, PICT, TIFF	N	Y
FONTS		
PostScript Type 1	N	Y
PostScript Type 3	N	Y
Compugraphic	Y	Y
Soft-Logik format	N	Y
Outlines on Screen	Y	Y
# Outline Fonts Included	2	**18**
Typographic Precision	1 pt	**0.01 pts**
Maximum Size	720 pts	**183,000 pts**
OUTPUT		
Amiga Preferences	Y	Y
Custom Printer Drivers	N	Y
Print to Disk	Y	Y
LAYOUT		
Templates	Y	Y
Master Pages	N	Y
Maximum Page Size	22x22 in	**1200x1200 ft**
Paragraph Tags	Y	Y
Snap-to-Grid	Y	Y
Snap-to-Guides	N	Y
Measurement Systems	3	**9**
TEXT		
Bold, Italics	Y / Y	Y / Y
Underline, Outline	Y / Y	Y / Y
Shadow, Light	N / N	Y / Y
Reverse, Strike-Through	N / N	Y / Y
Import ASCII	Y	Y
Import excellence!	N	Y
Import ProWrite	N	Y
Import WordPerfect	Y	Y



PageStream 2.2 in 16 color mode

The new PageStream 2.2 is a work of art. The first thing you notice is the snazzy new toolbox. But beauty is more than skin deep. A screenshot cannot show you the power of version 2.2. Using a common PageStream system, text speed is improved up to 500% over the previous release. The January issue of AmigaWorld called PageStream 2.1 the Experts' Choice, what will they call PageStream 2.2?

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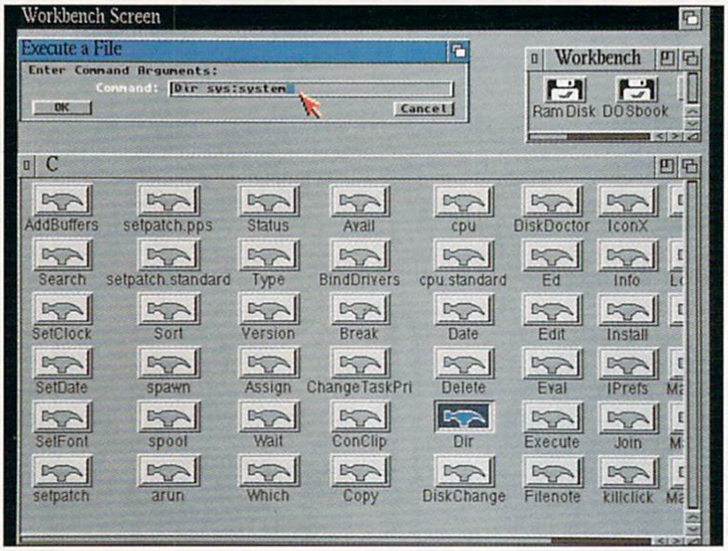
PageStream 2.2 is a free upgrade to registered PageStream 2.1 owners. It's our way of saying thank you for your patronage. With all the money this will save you, you will be able to pick up a Starter Fonts Pack for $99.95. The eight fonts in this package will make your pages come alive.

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Workbench 2.0 can display icons for files that do not have them. What's more, you can run CLI commands from Workbench.



creates a new drawer and then calls the Rename function, so you need not go through the clunky process of duplicating and renaming the Empty drawer.

The Snapshot item now has a submenu that lets you affect either just the window or the window and all of its contents—eliminating the need to select the window icon and all the icons therein before choosing Snapshot. The new UnSnapshot menu item deletes the icon's position information and allows the Workbench to decide where to place it.

The Leave Out option allows a program icon to appear in the Workbench window instead of in its disk or drawer window. This gives hard-drive users easy access to programs that are hidden away within a stack of drawers. There's even a Tools menu that allows programs to add their own menus to the Workbench (we will explore some of those programs in the next installment). To make things even easier, many of the most frequently used menu commands now have keyboard equivalents, such as Amiga-R for Rename, Amiga-A for Select All, and Amiga-S for Snapshot.

Exchange Greats

Another exciting addition to the system software is the Commodities Exchange. This is a library that provides a standard method for looking at or changing input from the mouse or keyboard. And the new system software includes several programs to support it. Blanker, for instance, turns the screen black after a period of inactivity, to save wear and tear on your monitor if you leave for several minutes. FKey is a keyboard-macro program that lets you program text strings into each of the function keys. IHelp allows you to assign to the function keys such processes as shrinking or enlarging the current window or cycling through windows and screens.

Another of these programs, AutoPoint, lets you automatically select the window under the mouse pointer without clicking in it. With ClickToFront, you can bring a window to the front simply by double-clicking it. NoCapsLock disables the CapsLock key for clumsy typists who inadvertently find themselves IN UPPER CASE.

While many of these functions have been available previously in the form of public-domain software, the Commodities Exchange provides a standard for them that guarantees their compatibility as the system software changes. It also ensures that no more than one application will require a particular key combination. (All hot-keys are user-programmable in Commodities applications).

Another exchange-standard the 2.0 Enhancer upgrade supplies is ARexx, William Hawes' very popular Amiga adaptation of the REXX programming language. As a script language, ARexx lets you program much more powerful scripts than does AmigaDOS's EXECUTE command, because it includes very sophisticated program support. More importantly, however, ARexx provides a standard means of interprocess communications, a way for one program to exchange information with another, and even to control that other program.

Most serious Amiga applications allow for control of almost all program functions from an ARexx script. Many programs such as ProWrite (New Horizons), Art Department Professional (ASDG), ToasterPaint (NewTek), and Image Master (Black Belt) require ARexx for access to their program macros—macros that let you perform a complex series of operations with a touch of a button. The inclusion of this important program, which sells separately for $49.94 (William Hawes), makes the 2.0 upgrade more tempting than ever.

So is there any reason for not upgrading? The most serious objection, besides the cost of 2.0, is possible incompatibility with the applications software you use. Fortunately for us, two years of experience with the A3000 has made software manufacturers well aware of the need for 2.0 compatibility. In addition, one reason Commodore was so long in fully releasing the upgrade was that the company took extraordinary pains to ensure that the new operating system would work with as much current software as possible—despite the many significant changes in 2.0.

While CBM was largely successful in this effort, some older software does not work with 2.0. Most of it falls into one of two categories: very early software released by manufacturers that have since gone out of business, and older European games from the bargain rack. This is hardly the kind of software around which to build your system, however. And even if you want to run some of this "obsolescentware," you are not necessarily prevented from upgrading. Several companies such as Alfa-Data, Utilities Unlimited, and DKB Software make ROM-switch boards that allow you to install both Kickstart 1.3 and 2.0 ROMs in your machine and then switch between them.

AmigaDOS 2.0 has something for just about everyone. Unless you are a very casual user, or only play games with your Amiga, you are certain to appreciate the convenience of the new operating environment. Moreover, by upgrading now, you are preparing your system to take advantage of the many 2.0-only features in upcoming software. ■

Sheldon Leemon, a well-respected authority on virtually every aspect of the Amiga, is currently writing a book on Workbench 2.0 for Compute! Books. When he is not writing for computer magazines, you can find him working at Slipped Disk, a Michigan-based Amiga dealer. Write to him c/o AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458.*



Video Painting

38

A continuing series of tips, techniques, and tricks for creating more imaginative Amiga graphics.

By Joel Hagen

IN "ACCENT" #32 (Oct. '91, p. 56), I wrote about using the Blend mode in **DCTV Paint** (***Digital Creations***) to give a painterly look to a digitized image. This column will discuss *video-painting* techniques using a simple combination of tools within DCTV's new version 1.1 software. *(To locate vendors of products mentioned, see the "Manufacturers'/Distributors' Addresses" list on p. 106.)*

I emphasize the term "video painting" for a reason. Painting with DCTV is not quite the same as painting with an RGB paint program like **Deluxe-Paint** (***Electronic Arts***), **Digi-Paint** (***NewTek***) or **SpectraColor** (***Oxxi***). In the RGB environment, painting is somewhat like creating a very detailed mosaic. The RGB mosaic tiles are pixels, individual points of light, the color and luminance of which are controlled by the artist. By contrast, the DCTV medium is video. The artist's brushstrokes, lines, and fills are all translated into a video waveform that is seen on a composite monitor or television screen.

Here, painting is done in the NTSC universe of 16 million colors, with the display consisting of somewhat fewer colors (approximately four to six million). A DCTV image is not the same as a 24-bit RGB image. It is a TV image that you can save as a 24-bit image as well as in DCTV format. For anyone working with video as the intended output, this video image is ideal. Gone is the guesswork of readability, how palette colors will translate, and so on. What you are looking at is essentially what you will get when you transfer the image or animation to tape.

Just as in traditional art media, such as watercolors and oils, there are differences in behavior among computer art media. DCTV painting tools and modes can produce images with a softness and translucency beyond the capabilities of HAM or 32-color painting environments. Also, you can produce smoother gradients in DCTV's video-color universe than you can in the Amiga's native display modes.

Tools of the Trade

Many of DCTV's tools have the feel of those I have used in high-priced 24-bit painting environments such as the IBM-based Tips and Lumena programs. For example, brushes in DCTV Paint can gradually lose color during a stroke, or blend with colors they pass over. These attributes are part of the Watercolor and Blend modes (keyboard shortcuts F5 and F6, respectively). You can also select brushes that are more heavily weighted with color in the center than at the edges. You can conveniently size these brushes with the + and – keys, as well as with sliders in the screen interface.

You can also use sliders to adjust the Flow rate, which controls the opacity of the video paint as it is applied to the screen in any mode. Again, however, I prefer using the keyboard to control Flow. The number keys 1 through 0 set the Flow, correspondingly, from 10% through 100%. For example, the 4-key sets a 40% Flow rate, and so on.

In combination, these tools constitute a powerful system for any artist, given the broad spectrum of available color. Experiment with the Watercolor mode in particular to pull subtle effects from your paintings. If you are an artist more at home with traditional brush and paint media, you may find the Watercolor mode with a Flow rate of 20% to 70% the closest analogue yet to traditional painting. You can build up colors in gradual layers with a very "painterly" feel. Even on an Amiga 1000 with a standard 68000 processor, these tools are responsive and dynamic. Most of the accompanying illustration, "Maori Sky," was done in Watercolor mode. Nearly everything in the painting made use of controlled Flow rate to achieve translucency.

With the right techniques, "video" painting with DCTV Paint can often yield more subtle effects and a more painterly look and feel than standard RGB paint programs.

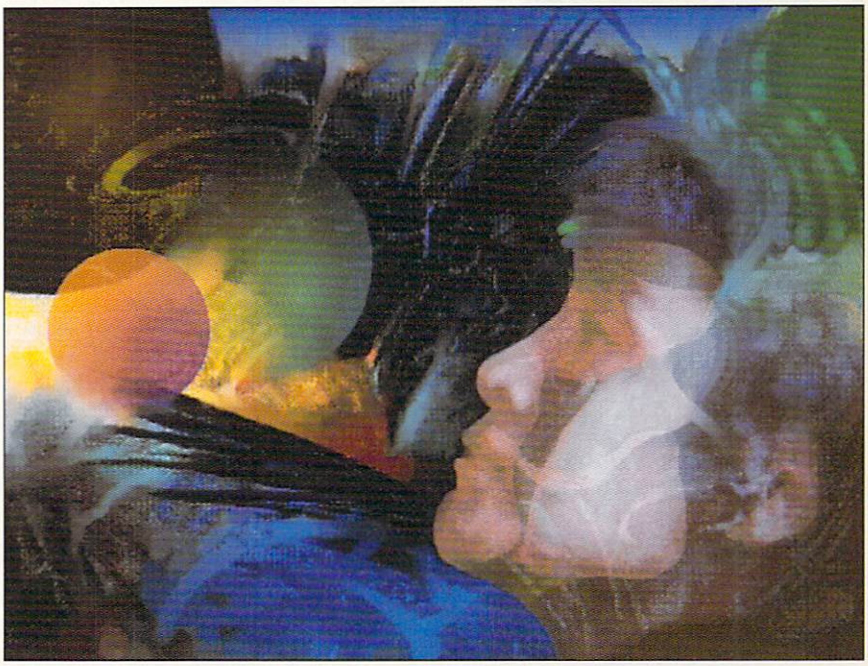
Even if you need to create a HAM image, you might consider making use of DCTV's superb painting tools. Once the painting is finished, use the conversion features in DCTV to save the image in one of the Amiga's native display modes. Because the HAM palette is calculated at the final stage from DCTV's 24-bit color universe, you may find less artifacting and fringing of color than in an overworked HAM painting.

The Video Canvas

The face in "Maori Sky" was pulled into the image from the spare screen in the Rub Through mode (F8). The face was originally done using techniques described in a previous *AmigaWorld* article of mine ("The Portrait Process," (Jan. '91, p. 41). With the face loaded on the spare screen, I painted dark, organic detail on the portion of the main image through which the face would be rubbed. With Flow rate set to 40%, I used the Filled Freehand tool with a Point highlight to loosely outline appropriate areas of the main image.

The face came through in abstract chunks, with detail from the main image faintly preserved, giving a tattooed look to the features. I let these chunks casually overlap to break up the face even more. At a later stage, I used a size-4 Blend brush to soften some of the transitions, unifying values and colors. Other filled shapes were added by setting soft gradients and using the Point highlight at low Flow rates. (DCTV 1.1, by the way, adds an Undo button—an indispensable feature for experimentation during painting.)

The color-mixing area in the Palette panel is a good place to create colors for Watercolor- or Airbrush-mode painting. Instead of manually mixing colors in that area, however, try this automatic trick: Set up a complex gradient of eight or ten colors in the Gradient panel. Then, in the Fill panel, select the 4-Point Gradient with no highlight. Click the Wipe button on the control panel. The palette-mixing area will fill with a complex rainbow of colors, any of which can be used for painting by holding down the Shift key as the color is selected with the cursor.



The video painting "Maori Sky" (above) was created with DCTV's Watercolor and Rub Through modes, using varied Flow rates.

Try other combinations of Gradient types and Flow rates to quickly create a rich pool of colors in the mixing area. I often use the Filled Rectangle tool with black paint and a Vertical highlight to add a gradation of shades to the colors in the mixing area.

Sometimes the hardest part of painting is just getting started, getting some color on the screen. If you find yourself blocked like this, follow the mixing area ideas outlined above, but hold down the Shift key when you hit the Wipe button. This will fill the entire screen with the gradient, giving you a kickstart to begin painting.

As a paint package, DCTV gives the Amiga artist high-end tools and display at a bargain price, and DCTV images take up far less disk space than do their 24-bit counterparts. If you already own DCTV, I highly recommend the $15 upgrade to version 1.1, with its new manual. The interface is expanded and streamlined, text is easier to handle, there are new fills and features, palettes can be loaded and saved, and the long-cherished Undo button at last occupies a well-deserved spot on screen. ■

Joel Hagen's credits include work in art, astronomy, science fiction, and software development. Write to him at 10512 Sawyer, Oakdale, CA 95361. Please include a stamped, self-addressed envelope for a reply.



Special Effects at Low Cost

Ignore the traditional techno-snobs who claim you can't do high-end special effects on the Amiga. Give these a try.

By Gene Hamm

PICTURE THIS: YOUR script calls for a person to lean out of a burning building's window screaming for help. By traditional methods, this is a budget-busting effect: The cost of constructing a set to burn down and insuring the actor standing close to the fire are practically prohibitive.

Or imagine: You want a live actor in a Toon Town-like world to walk through a cartoon doorway. If the doorway is to appear in front of the live actor, you can simply genlock the cartoon over the live video. If the actor needs to be in front of the doorway, however, it's a little more complicated, but still possible. You need a chromakey, such as ***MicroSearch***'s **ChromaKey** ($395), to put the graphics behind the live video. Will your graphics be in front of or behind the actor? Conventional reasoning tells you that you can't have both. If you want the live actor to come around from behind the wall, walk through the doorway, and then turn and walk off in front of the wall, you're out of luck, right?

Wrong! Traditional methods and conventional reasoning don't take the Amiga into account. (*To locate the vendors of the products mentioned, see the "Manufacturers'/Distributors' Addresses" list on p. 106.*)



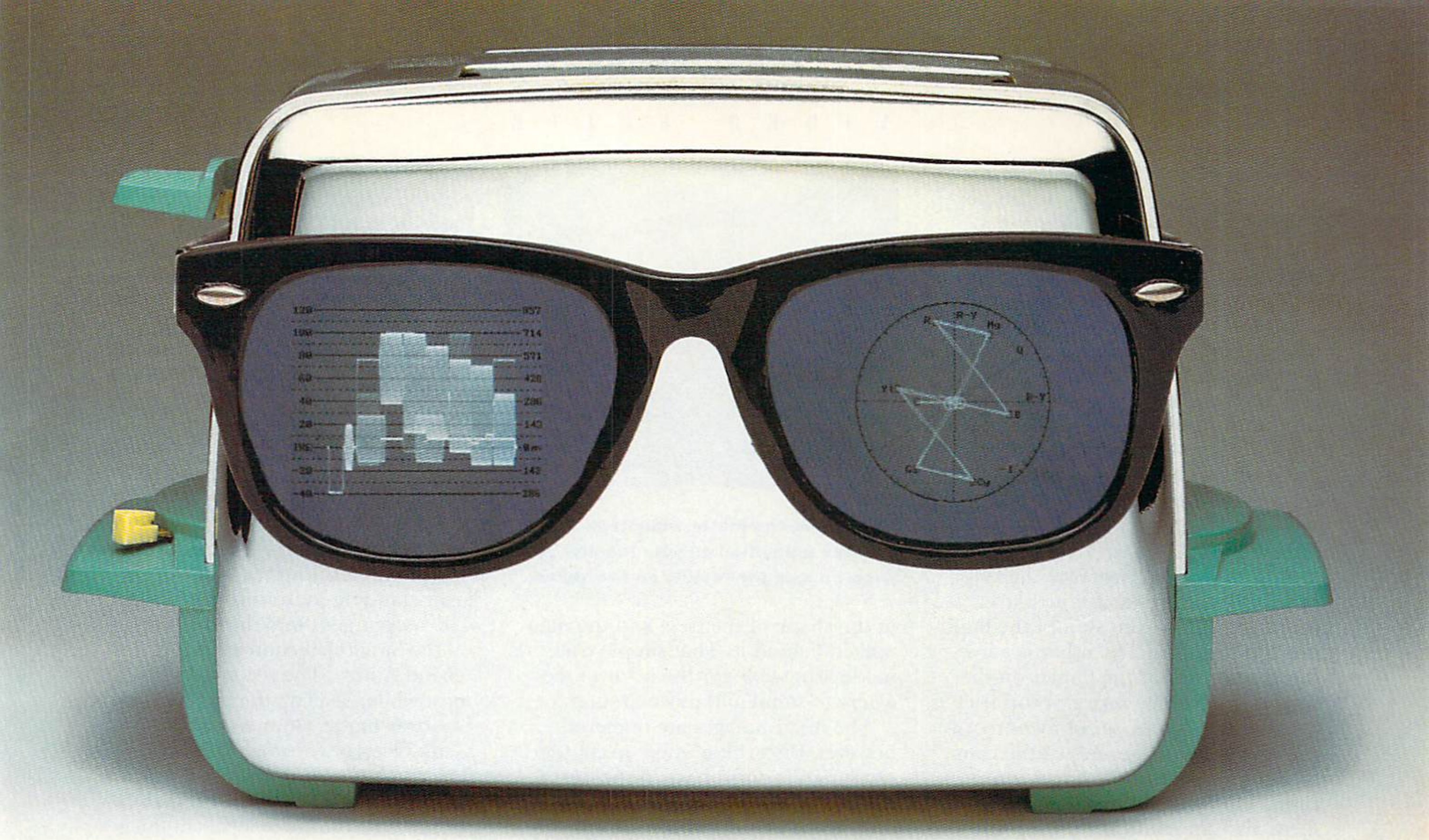
Who needs props? All you need is DeluxePaint, a video camera, and a chromakey to show the actor standing in front of an Amiga-generated, chromakeyed door.

Got a Match?

First let's tackle the burning-building shot. You can use a tripod, lock off the camcorder so it is rock steady, shoot the building and the actor, and bring the tape back to your Amiga. Next you create the flames as ANIMbrushes in ***Electronic Arts***' **DeluxePaint III** or **IV** ($99.95 or $179.95) and genlock them over the building. Just register the flames to the windows and set the faders on the genlock until the transparency of the flames looks right. For this, I use ***Digital Creations***' **SuperGen** ($749.95).

However, even if you were to realistically animate the flames and make them transparent, the believability of this method works only so far. Because there is always an abrupt edge to graphics genlocked over live action, the fire still looks like graphics over live action. Genlocks work well for solid, opaque objects, but tend to make transparent, wispy objects—fire, smoke, explosions, clouds, or neon glows—look solid as well, because of the abrupt edge. The old-school techno-snobs will explain that you need a soft-edge matte and that the *only* machine for the job is a $15,000 Ultimatte.

They're half right. You *do* need a soft-edge matte, but you can connect two camcorders and the Amiga to create the same effect for much less money with ***Panasonic***'s **WJ-MX10** ($1850). The WJ-MX10 works with all Amigas, and it has a built-in time-base ►



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corrector, so you can plug in ordinary VHS camcorders or VCRs. It can perform wipes, switches between video sources, dissolves, and superimpositions. For the fire effect, you use the superimposition function.

For this technique, the Amiga does not feed into the video through a genlock, but serves as an animation tool and display screen. Create your ANIMbrushes with DPaint; keep them small, from one to two inches square. They needn't be subtle gradients of yellow to red-orange. In fact, the process works better if they aren't dithered at all.

Plug two camcorders into the WJ-MX10. One serves as a tape player, running the tape you shot of the building and the actor. The other is a live camera pointed at the flames on the Amiga screen. The secret of this trick is to shoot the flames out of focus to give the proper soft edge. Adjust the camcorder's focus until the edges look right. Throwing the picture out of focus also automatically dithers the crudely drawn flames. Adjusting the fade control on the WJ-MX10 changes the degree of transparency of the flames. The result looks as though you had spent a lot on high-end special effects equipment.

Using the same technique, you can create a safe explosion right next to an actor. As the actor walks through some low bushes, your assistant hides below camera level with a photo flash. When he sets off the flash, the actor jumps out of the shot, as if propelled by the force of the explosion. Back in the studio, you animate the explosion and superimpose it over the flash, making it seem as if the animated explosion lit the scene. As the animated smoke spreads, slowly fade out the explosion with the WJ-MX10 wipe/mix lever. Finally, add the proper sound effects to complete your safe explosion.

KNOCK, KNOCK

The Toon-Town-doorway effect requires two Amigas, two genlocks, and the ChromaKey. If you only have one Amiga, don't panic. Most communities have Amiga user groups. You can probably rent or even borrow the extra Amiga and SuperGen from them. Even if you do buy all the equipment required for this effect, you'll still spend only a fraction of the cost of the high-end equipment the techno-snobs own.

MicroSearch's promotional videotape for ChromaKey shows a man emerging from behind a tree in a forest. A sheet of blue cardboard was cut in the shape of the tree, and the man walked behind it. That simple trick made it possible for the actor to see where to stand and move around.



For a soft-edge matte, videotape an out-of-focus animation on your monitor and superimpose the results on live video.

The disadvantages are numerous, however. Discerning where to cut the cardboard is difficult when the tree exists only on disk or videotape. You can look at the monitor while you cut, but that is so awkward, and you will probably just watch yourself cutting your fingers. It is also wasteful, as you may have to go through several sheets of cardboard before the matte is perfect. If it is not cut precisely, the actor will either walk through part of the tree or look slightly disembodied as he appears out of thin air next to the tree. At best, a cut-out matte works only for stationary objects, not for anything that moves.

With the Amiga, however, nothing has to exist in physical reality. The whole set, mattes and all, can exist digitally inside the computer. You must, however, draw all the graphics in overscan, so they'll be in the same format as the live video. The graphics require three versions of the same picture.

For the Toon-Town-doorway effect, first line up your shot of the actor in front of the blue screen with the video camera. On the floor, mark with tape the path your actor will walk. These marks and your verbal directions are the actor's only directions, because the set is invisible.

Have the actor stand where the door should be. Set the SuperGen graphics slider (the one on the right) to about halfway up, so you can see both the Amiga screen and the live video. Compose your shot so that the door is big enough for the actor to walk through without touching it. With DPaint, use the straight-line tool to draw the door around the actor. Lock off your camera and sandbag the tripod. Make sure nobody bumps into it, or your registration will be off and you will have to start over again. Now, send the actor on break and complete the artwork.

Draw the doorway with as much detail as you want. When it is finished, save it under the name Doorway. Change the inside of the doorway to the background (or drop-out) color, and save that image as Doorway-matte.

Connect the ChromaKey to the Amiga and to the camera that is pointed at the actor in front of the blue screen. This Amiga will display the Doorway artwork, so the combination of the actor against the blue screen and Doorway should result in the effect of the actor standing in front of the artwork. The output goes into the video input on the SuperGen connected to the second Amiga. The second Amiga, meanwhile, displays the picture marked Doorway-matte. Connect the SuperGen's Overlay 1 to your VCR's video in. The combination of the two Amigas, SuperGen, camera, and ChromaKey should give you three layers of images from back to front: the Doorway artwork at the back, the actor in the middle, and Doorway-matte in the front.

With SuperGen's graphics slider all the way up, practice the effect. The actor walks from behind the wall, pauses in the middle of the doorway, then walks through it and off-screen to the right. The actor must pause in the doorway to give you time to bring the graphics slider all the way down to fade out Doorway-matte. Timing is crucial so that the actor doesn't walk into the matte. When it feels right, press record on your VCR. Within four or five tries, you should have an acceptable take.

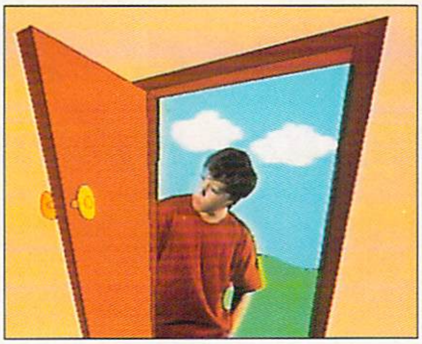
CAN'T SEE THE VILLAIN FOR THE TREES

The combination of Amiga video tools for this simple door trick allows for some more complicated variations on the same effect. Try a live-action version of the old cartoon trick, in which a big villain sneaks from narrow tree to narrow tree, each time managing to hide behind trees that are skinnier than he is.

Line up the actor as before, marking the path with tape, and in DeluxePaint draw a layout of the grove of thin trees, with four major trees in the foreground. From the left, these are the first, second, third, and fourth. Save the layout as Grove. In the animation menu, set the number of frames to five. DPaint automatically copies Grove to all five frames. In frame 1, change everything to the right of the fourth ►

tree to the background color. In frame 2, switch everything to the right of the third tree to the background color, and so on for frames 3 and 4. For frame 5, clear the whole screen to the background/drop-out color and save it under the name Grove-matte-anim.

Keep all the equipment connected as it was for the doorway. The first Amiga displays Grove, with the actor chromakeyed against the image. The second Amiga displays the first frame of Grove-matte-anim. The actor hides behind the fourth tree. When he sneaks to the third tree, he first tiptoes to the right, clearing the fourth tree, before circling back left to hide behind the third tree. When he clears the fourth tree, press 2 to advance to frame 2. Once behind the third tree, he repeats the same motion to get behind the second tree. As before, when he clears the third tree, press 2 to advance to frame 3. Repeat the same movement and advancement of one frame to get him behind the first tree. When he clears the first tree, advance to frame 5, so he is now in front of all the mattes and can sneak off screen-left. With some practice, you should get an acceptable take in a few tries.



The actor is sandwiched between the chromakeyed and genlocked doors.

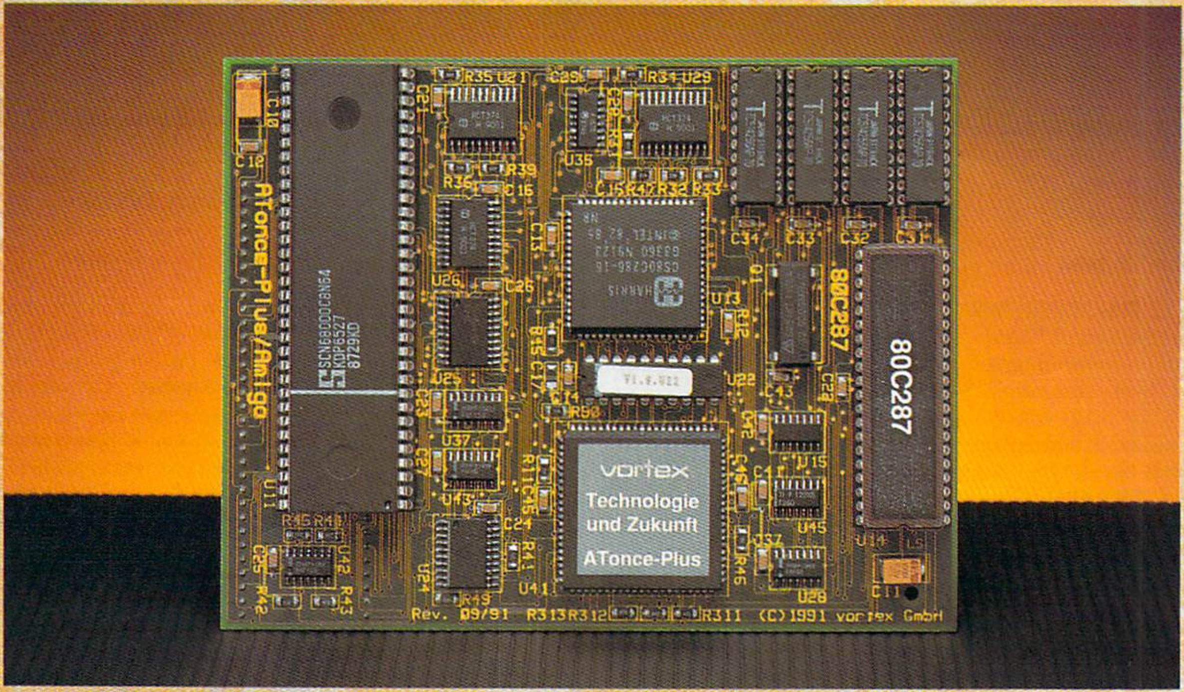
In another variation of the same technique, you can show a live actor who just received a bump on the noggin, with stars swirling around his head. Allowing for perspective, make the path of the animated stars a diagonal oval. The stars in front of the actor will be at the top half of the oval. The bottom half will contain the stars that are behind the actor. Animate the top half with the stars arcing from left to right in six frames, and save it as Stars-front-anim. Then animate the bottom half with the stars arcing from right to left in six frames, and save it as Stars-back-anim.

With the same video connections as before, the first Amiga displays Stars-back-anim with the actor's head chromakeyed against it. The second Amiga displays Stars-front-anim in front of the actor. With the actor performing appropriately punchy facial expressions, shoot a long take of the scene. The two simultaneously running animations should stay in sync long enough at some point to edit an acceptable take.

With a little imagination and planning, all your Amiga special effects will be knockouts. ■

Gene Hamm is a veteran animator whose credits include The Gumby Show. He currently does traditional animation for Colossal Pictures, and computer animation and video on a freelance basis. Write to him c/o AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458.*

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THE GAME PRESERVE

Out of This World

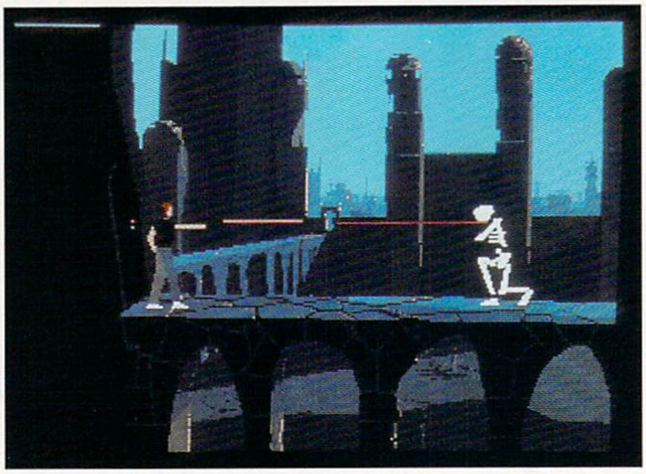
By Peter Olafson

Out of This World (*Interplay Productions*, $59.95) could not have been better named. This extraordinary game, while really just a sophisticated action-adventure, feels like so much more.

You're a scientist running an anti-matter experiment on a particle accelerator when a lightning bolt intercedes and warps you into an alien world—an intensely hostile alien world. Walk off the screen, and you're in danger. Stand still too long, and you're in danger.

Something with tentacles at the bottom of the pool in which you appear wants a taste of you. Poisonous slugs—one bite and you're history—inhabit two adjoining screens. A sort of hunchbacked panther in the background has his red eyes on you. And if you survive all that...well, you'll see, if you're slick. That's just the first level.

The perspective is the customary side view, but this isn't just a set of sequential screens. It's a series of linked, gray-toned environments that you may have to traverse two or three times, in a variety of directions, to escape with your shirt. A nice array of talents are required—from working well with others to creative thinking—and the rewards for success are plentiful. (Do be sure to explore the top of the elevator shaft on the second level for a genuinely awe-inspiring scene.)



Another world of danger ... tread carefully.

Out of This World has atmosphere to spare. Windblown litter crosses the parking lot in the intro. Birds populate alien skies. The pool where your character appears has just the right wavy, underwater murk. On the second level, when you extricate yourself from a cage, watch how a breakaway piece zooms out of the screen and the guard in the background appears and disappears with a smear of color behind him.

The damnable thing about it is that it's all so lifelike. That panther really runs like a big cat. The animation outdoes Broderbund's Prince of Persia for smoothness and realism. And if all of this isn't cinematic enough for you, you can experiment with the high-resolution, back-row-seat screens available from the function keys. It'll take you back to Dragon's Lair days.

There's no save feature, but once you reach a new level, you're supplied with a four-letter code that you can punch in at the start and jump to the beginning of any level you've reached. Out of This World makes you work like a bear to get through that initial section, however, and there seems to be no way to interrupt the lengthy (but very neat!) introduction until you get past the opening level.

You can put the game on hard disk, run it in 512K or on an A3000 under 2.0. However, it doesn't quit to Workbench—you have to reboot—and the manual is a little bit of a thing that wastes the opportunity to set the scene and includes what appear to be hard-disk installation instructions for the Atari ST instead of the Amiga. (The installation instruc- ►

Crib Notes

By Peter Olafson

Last time, exploring Dynamix's *Heart of China* ($59.95), we took Jake Masters and party all the way to Istanbul...and stranded them there when I ran out of space. But what kind of host would I be if I didn't at least put them on the train?

Actually, there's this little problem to overcome before we get our gang aboard the Orient Express. Y'see, Jake has been captured by the nabob's guards.

The first thing you need is money. We've already had Kate pawn her locket for 105 sheckels. If you're having trouble getting that nice price, suggest to Kasim that if the market is flooded (as he claims), perhaps you should hold onto it for a while. That'll get him every time.

There are a few things for sale at the shop—hookah, turban, and sitar—and I can see the sweat breaking out on your upper lip as you realize the combined prices are more than the money you have. Don't worry. You need only the hacksaw to finish the game. The other stuff has no use.

However, you *will* need more money to buy a camel, as the camel dealer won't even talk to you unless you have 200 sheckels (though he'll take less). You're going to have to play Mohmar's shell game first.

Yuck. I can suggest only that you keep your eyes wide open here. Mohmar's business practices are a bit...well, creative, so save your game before you proceed and keep your eyes peeled for funny business. (If he starts to lose, there will most assuredly be funny business.)

Now get your camel. Walk a fine line in your negotiations with Acayib—bargaining as though you mean it, but not to the point of real rude- ►

To locate vendors of the games reviewed, see the "Manufacturers'/Distributors' Addresses" list on p. 106.

Circle 178 on Reader Service card.

tions in the ReadMe file are faulty as well.)

Those are the only problems, however, and they barely merit mention. This is a positively heroic effort. I can fairly guarantee you have never seen anything like it before.

LEANDER

By Rob Lawrence

Once again, ***Psygnosis*** has done it: **Leander** ($49.99) has cinematic music, crisp sound effects, and crystal graphics, *and* it's a lot of downright fun!

Forget about the plot; it's your typical kill-all-and-win-the-princess story. Your objective is to hack and jump through three immense worlds to defeat the evil Thanatos. Similar to Shadow of the Beast II, Leander is a platform game that scrolls in every direction. All movement is incredibly smooth, and I have yet to see any slowing caused by multiple animations. You can still jump from any height and survive if you hit flat ground, but unlike Beast II, here you have true midair control over your movements—something to cherish in a game that's this tough.



Save Princess Lucanna from Thanatos, or die trying.

Leander is very pleasing to watch and hear. The vividly colored, super-detailed scenery is stunning—rushing waterfalls, lush vegetation, ancient stonework, gleaming metal. The introduction has some of the most enchanting Amiga music I've ever heard, and the game soundtrack is almost equally impressive. By default, it's uninterrupted by sound effects, but you can switch them on at any time.

As for enemies, the game offers more than enough. Fully animated sprites of all sizes—including humans, animals, plants, dragons, and even some freaks of evolution (such as winged snakes)—lurk in every corner. Treasures and traps abound throughout the worlds, and the ever-present spike pit is always waiting for those who venture too far beyond their sight.

If you need help surviving, look for the shops that sell armor and blades. Each blade has its unique abilities, but my sword of choice is the tempest blade. Upon powering up, you release the button and become a whirlwind of spinning scimitar, slicing your way through anything in your path. For desperate situations, you have a suicide weapon that costs you a life but annihilates almost everything on the screen.

As mentioned, Leander isn't easy. It is, however, far less impossible than some past Psygnosis releases, and it's not insanely paced. You'll receive pass codes at the end of each world, saving you from endless replay. Drive access is appreciably fast, so there's never a dull moment.

Complaints? Just the usual stingy manual and disk-based copy-protection. A few more weapons would be nice, too. Other than that, this game is flawless.

FIGHTER DUEL: CORSAIR VS. ZERO

By Rob Hays

Ask any aviation buff which were the best fighters of World War II, and near the top of everyone's list will be the Japanese A6M Zero and the American F4U Corsair. You can fly either one in **Fighter Duel** (*Jaeger Software*, $49.95) against the computer or a friend (via modem).

Fighter Duel takes a unique approach to flight simulation, with concentration on accurate aerodynamic modelling. For instance, the engine on the Corsair was so large and powerful that ►

ness. You should be able to get the humperama for 100 sheckels.

Finally, you'll need an ally. If you've been extra nice to the old lady (Almira) beside the palace and you have the necessary equipment, it's as simple as going to visit her again. If not, well, the flower from the city gates should help this relationship blossom.

What flower, you say? You'll need to make a bit of a scene at the fruit stand.

Bit of a sticky wicket in the way of your escape, though: Lucky's plane has been blown up, and not by the wind, either. (And, jeez, it looks like Chi went with it, doesn't it?) The alternative is the train, so run and catch it.

Kate seems a bit riled up, so make nice to her. The best route here is flattery. (Tell her you like her hair or something.)

However, that's just postponing the inevitable. We've reached the romantic part of the game, and you'll need to do well here to reach the best of the five endings. I'm not going to hold your hand through this—hey, that's Lucky's and Kate's job! (grin)—but here are some general pointers for both ends of the dialogue. (There may be more than one way to go about this, too.)

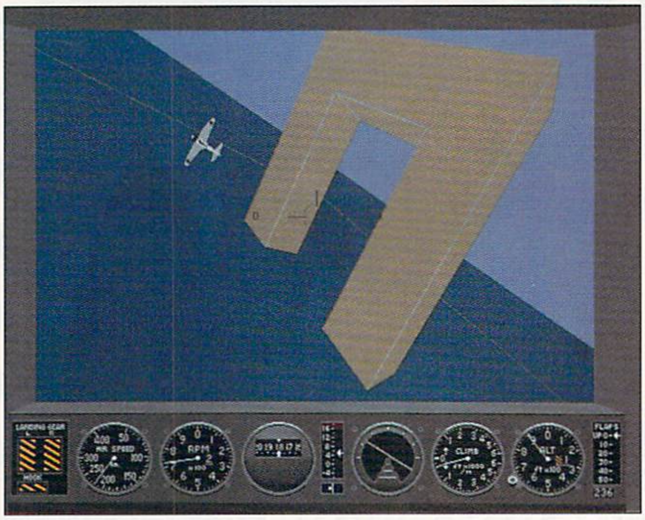
Like Lucky, be honest, but stand up for yourself when Kate gets nasty, and don't be afraid to turn the tables on her and get her to 'fess up. For Kate's part, resist the temptation to dig into Lucky too deeply. Soften up a bit. And you might suggest, in the most casual of ways, that you could be interested as well.

Almost forgot that nasty business with Tong on top of the train! This sequence pretty much observes the arcade conventions: duck for tunnels (my big problem), attack in full force, and retreat to an adjoining car to rest when tired. (If pursued, fight Tong off, but keep resting until your strength returns.) When he finally retreats, follow him to the caboose. You made it!

If you're having trouble with an adventure or role-playing game, or just like stuffing things in blue boxes, you can reach me via U.S. mail at 25 Belmont Ave., Madison, NJ 07940, or by electronic mail on GEnie as P.OLAFSON1, on Portal as Peteroo, and via UUCP as Peteroo amiglynx.UU.NET. Say that five times, fast. □

the torque produced at full throttle tended to cause the plane to roll to the left. Consequently, you have to adjust the trim settings on the controls to maintain level flight.

Also unique is the ability to pan the view. Simply press the right mouse button, and by moving the mouse you can "turn your head" to look in any direction.



Hop into the cockpit of an American F4U Corsair or a Japanese A6M Zero.

The program uses a high-resolution interlaced screen, with colors chosen to minimize flicker, although they can be modified somewhat to offset differences in monitors. If you have any fast RAM attached to your Amiga, Fighter Duel will operate at an amazing 28 frames per second. Without it, you get 24 frames per second. The landscape is less than realistic, consisting of 4000-foot towers and an arch, but it serves the purpose of giving you ground obstacles to avoid while concentrating on dogfighting.

The program is supplied on two disks, with manual-based copy protection. It requires a joystick (digital or analog) and one megabyte of memory (or more, if you have the 2.04 ROM installed). Hard-disk installation is flawless, flexible, and simple. The program even checks the target partition to make sure you have enough room before copying files.

The manual states that Fighter Duel was thoroughly tested to ensure compatibility with all Amigas, including 68040-accelerated models; the game refused, however, to load on one of my A500s. A call to Jaeger Software resulted in a personal download from their office of an updated program module that corrected the problem. According to Jaeger, the problem appears on some Amigas with the 2.04 ROM and the standard 68000 processor.

Like the planes of the 1940s it models, Fighter Duel can be a handful to fly, but it rewards you with a real feeling of accomplishment and makes you appreciate what was involved in flying one of those powerful fighters.

Hare Raising Havoc

By Peter Olafson

A button-pusher's delight, **Hare Raising Havoc** (***Walt Disney Computer Software***, $49.95) is an arcade-puzzle game that would have made Rube Goldberg proud.

Roger Rabbit has an hour to recover an AWOL Baby Herman, who wandered off in search of a bottle. Roger's search takes him on a trek through at least seven obstacle-laden levels: living room, kitchen, bathroom, backyard, the street, a construction site, and (naturally) a dairy.

They're all highly, and sometimes wildly, interactive—full of items to use, manipulate, run into or pick up with a push of the firebutton. The path to the exit—not always apparent—is invariably one that abuses the rubber-bodied Roger in every way possible and makes good use of the objects available.

There are plenty of objects. For example, in the living room, where the game opens, Roger can bounce on both cushions of the sofa (with different effects), start the ceiling fan (and get caught by it), open the ironing board (on his head), try to pet the goldfish (the animals in this house are brutal), move the hassock (and stub his toe), peek under the rug, and struggle with the door.

It's fruitless. The door is never the way out. But propel Roger through the window above it? Squeeze him paper-thin so he can fit under it? Flush him down the toilet? That, Hare Raising Havoc can do.

The game itself is charming—rather like a Roger Rabbit cartoon—even if you're not nuts about its principal player. (Personally, I'm more of a Jessica Rabbit fan.) The horizontal scrolling is seamless. The puzzles are clever—not to say demented—and the backdrops have that fat, glossy look of the classic 1940's cartoons that inspired the Roger series.

For me, however, Roger played best when imitating a silent movie—with the sound disabled. Why? Well, there's a huge amount of digitized speech and many sound effects, from the spoken introduction to Roger's frequent screams and shakes of his addled head.

Unfortunately, the sounds and the sights don't live together happily on my machine. Each effect loads immediately before the event it illustrates, with the result that notable pauses occur in the animation. So, for example, Roger doesn't simply fall into the kitchen, but falls a bit, stops briefly in mid-air as the "crash" sound loads, and then falls the rest of the way. It doesn't make the game unplayable—far from it—but it's annoying after a while.

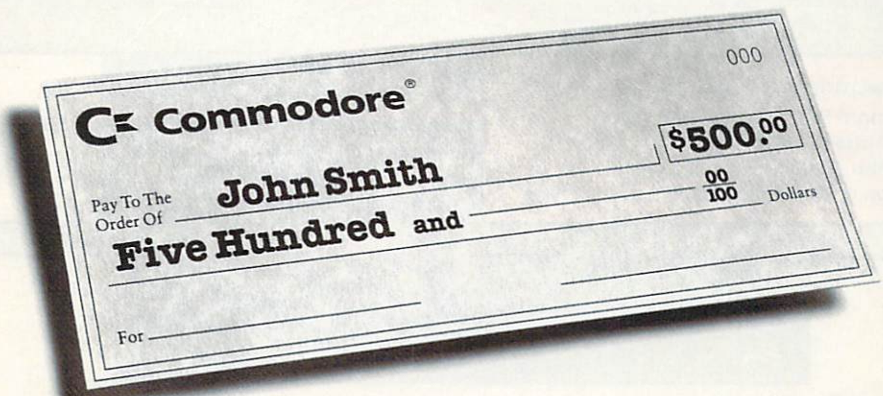
An insert in the box says the animation runs smoothly on machines with two megs or better, but this glitch happened on my three-megabyte 500.

HHH is one of a growing school of games that can't be played optimally on an out-of-the-box Amiga. In fact, on bare-bones, lower-end machines, it can't be played at all. It requires a hard disk—where its six disks unfold to 6.8 megabytes—and while a megabyte of memory is required, two is recommended. (A3000 users should note that HHH's documentation does not claim it supports AmigaDOS 2.0.

Hare Raising Havoc had the potential to be a showcase Amiga game. It isn't quite that, but it is a good one—shortcomings and all. If there's a sequel, I hope Disney integrates the sounds with the sights a bit more subtly. Puh-leeez? ■

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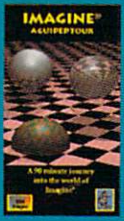
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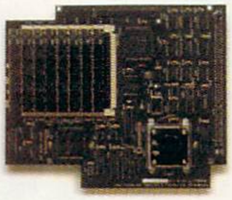
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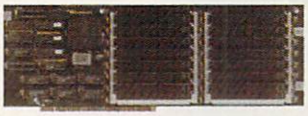
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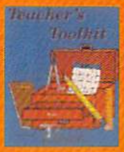


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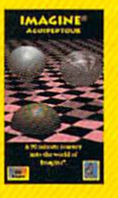
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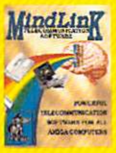
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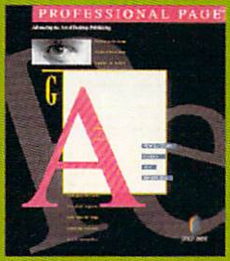
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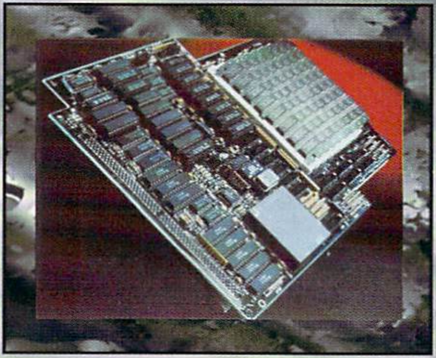
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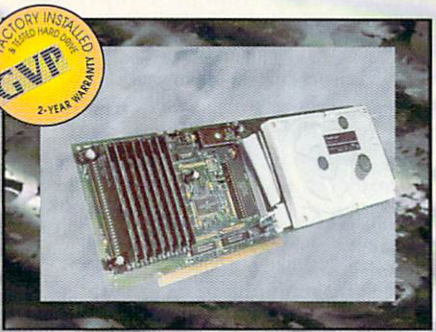
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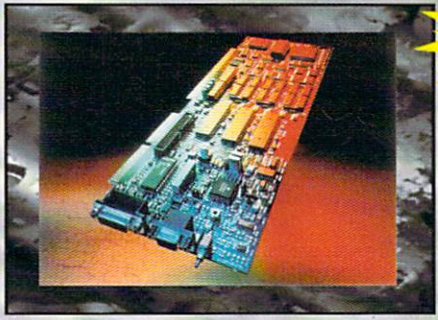


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From p. 24.
line-art conversion, dynamic-range adjustment, and Convolve, to name a few.

Imagemaster has so many unique and interesting features that it would be impossible to list them all with detailed explanations within the confines of this review. Some of my favorites are Asterize, which adds a star shape (somewhat like a lens flare or a glint, and fully adjustable in size, thickness and color); Relief, which makes an image look like a brass rubbing; Radial Wave, in which the image appears as if you are looking through ripples of water; many Fun House-type mirror effects; 3-D rotation; Contour mapping; DCTV zipper removal; and several types of motion blur to create moving objects and even rotating wheels.

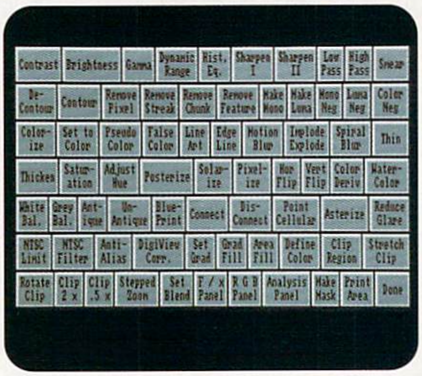
AD Pro has nowhere near the number of image-processing applications that Imagemaster has, and most of those in AD Pro have equivalents in Imagemaster. Even so, the AD Pro versions are faster and easier to use.

One of AD Pro's real strengths lies in its ability to load and save a wide variety of formats, and the new 2.0 version supports, among others, BMP (Windows), DeluxePaint IIE (IBM version), FrameGrabber, GIF, HAM-E, Digi-View 3.0 and 4.0, Impulse, IV24, MacPaint, PCX, QRT, Sculpt, and JPEG. It can also grab the intuition pointer, screens, and images in the clipboard. You can buy additional loaders and savers for TARGA, TIFF, and others, with new ones continually being made available and easily added.

While Imagemaster also loads a variety of formats, it encounters some difficulty with DCTV files, which lose resolution and have aliases. Digital Creations is currently creating libraries, available to third parties, that will solve this problem. With ARexx, you can hit a hot-key to save and load in JPEG, Raw, or in the Black Belt proprietary format. Both programs will try to figure out the format of the image as you load it in, so, unlike earlier versions of AD Pro, you don't need to know the format of an image to load it.

AD Pro can directly render into Commodore A2410, Firecracker 24, HAM-E, DCTV, Harlequin, and other devices, including scanners and film recorders. Imagemaster can render to DCTV, and there are versions that render directly to FireCracker 24 (Imagemaster F/C) and HAM-E (Image Professional)—allowing you to work with them interactively and with the Imagemaster paint program (more on that later). If you have ARexx, you can press a hot-key and see the image rendered to the Firecracker. Since both programs make it easy to add new loaders, savers, and renderers, new ones should appear regularly for all possible hardware needs.

AD Pro's dithering routines are the best I've ever seen, and if you want to create standard Amiga-format images from 24-bit color images, it is the only choice. The dithering routines create hundreds of apparent additional colors. While Imagemaster uses dithering, its routines are not as sophisticated as AD Pro's, and the results are not as good. AD Pro's HAM-rendering routines are also superior. This has no effect on images viewed in 24-bit, which look great in both programs.



Imagemaster's button mania.

ASDG, the developer of AD Pro, has long been a leader in dealing with color imaging and printing. Once of the unique features of AD Pro 2 is its new print capability, which increases the standard color printing of the Amiga from 12 to 24 bits. Gray-scale printing is also increased to a full eight bits, and both use the normal Amiga printer drivers on any printer that supports color or gray scale. You can even print 24-bit posters the size of billboards. The results are absolutely staggering, and after you see them, you will not want to do your printing in any other way.

AD Pro also saves images as PostScript files, which can later be sent to a PostScript printer or loaded into programs that support encapsulated PostScript files. These files can be color, gray scale, or color separated, and you have complete control over page and image size, xy offsets, color density, and angle. You can have registration and crop marks, mirroring, negatives, and page-eject control.

AD Pro's 12- or 24-bit nonPostScript color separations can be RGB, three-color (CYM), or four-color (CMYK). You have control over Under Color Removal (UCR), and Gray Component Replacement (GCR), and you can adjust the ink-compensation values. AD Pro's color printing technology is state of the art.

In professional environments, most 24-bit graphics are created through compositing, using individual elements and layering them together. While you can control the amount of transparency and set any color as a transparent color, AD Pro often requires you to create masks in a separate paint program.

Two Sumu Wrestlers

As previously mentioned, Imagemaster, lets you create sophisticated masks from within the program. You can have an unlimited number of buffers in which to store the various images you want to combine, whereas AD Pro lets you load in only two images at a time. While AD Pro's compositing is fast and easy to use, it is also fairly limited compared to the compositing capabilities found in Imagemaster.

With over 30 options in Imagemaster's Compose panel, you can assemble composite images with antialiasing, emboss one image onto another, have precise control over blending, logical operations, color keying, rub-thru, and much more. You can also clip an area from any image in a buffer and combine it with an image in another buffer. (One of the aspects of these clips is that they remember from which image they came, so you can process them in magnified mode, and then restore them to the original image.)

Imagemaster also includes a complete 24-bit paint program that you can use even if you do not have a 24-bit display device. While the on-screen representation (using dithering) is okay, its real use is to allow you to create and manipulate images in 24-bit for final 24-bit display or printing. The versions for the Firecracker and HAM-E will display the full color of those devices as you paint.

You can use an image from any buffer as a brush and make use of Imagemaster's full complement of drawing tools. It even has ReDo, as popularized in Digi-Paint.

All the professionals I know who work with Amiga graphics use Art Department Professional as one of their most important tools. Having developed through several versions, it is a stable and mature product with features found nowhere else. Relatively new to the market (being an expanded version of the original

HAM-E Image Professional), Imagemaster is continually upgraded and is a growing product with an already impressive number of features. I think both professional and amateur users alike will want to add it to their primary working tools. The two programs work well together and will give you the tools you need to tackle almost any job.

Product Updates

As this review was going to press, AmigaWorld *received word that ASDG was about to ship a revised version of AD Pro 2—AD Pro 2.1.0. The new version will be sent free to all registered 2.0 owners. Upgrades are available at $75 to AD Pro 1 owners and for $130 to owners of The Art Department (TAD).*

The new version is reported to enhance AD Pro's file-transfer capabilities by incorporating a new IFF format, SPLT, that facilitates transferring large images between the Amiga and the IBM PC or the Macintosh by using "split/join" tools.

In addition, ASDG reports that version 2.1.0 will provide a new, visually oriented frame-editing program (FRED) designed to enhance animation capabilities by providing easier batch processing, allowing AD Pro to generate animation effects automatically, and permitting users to preview animations before single-frame recording them.

The new version also promises enhancements for video use, including new roll and broadcast operators. Additionally, ASDG reports that its Prefprinter saver has been improved by incorporating eight new dithering methods designed to enhance print quality.

Also, Black Belt has announced the addition to Imagemaster of true infinite morphing, a technique popularized by "Terminator 2."

Foundation

Impulse

It's multimedia, no matter how you stack it.

By Dave McClellan

A COUPLE OF years ago, Intuitive Technologies introduced a product that looked as if it would finally bring Macintosh Hypercard capabilities to the Amiga. UltraCard showed a tremendous amount of promise, unfortunately, however, the program lacked polish and was riddled with bugs. Now ***Impulse*** has breathed new life into this multimedia presentation product and reintroduced it as **Foundation** ($250).

What It Is

To better understand the program's capabilities, you should know that a Foundation application is built around a "stack," an object comprised of frames such as screens or dialog boxes. Within these frames, you place your buttons, images, and text fields. Each application will have a backdrop, where you place objects shared by all the frames. Event-handling scripts are built into all objects, so that you can click on anything in a stack and trigger a script.

Foundation runs the stack by beginning at the first frame, executing any startup action that the frame's "Frame. Entry" script spells out, and then moving from object to object and frame to frame according to the user's actions and script handlers. ►

A stack can also play sounds and simple animations, display IFF graphics, drive the serial port, read and write files, and even help develop Foundation applications. Foundation, like Hypercard, can even call externally-written code and ARexx functions to do things not built into its extensive script language (and believe me, it's extensive!).

To support outside development, Impulse provides a run-time version of the program, the FAST.RT Runtime Browser, for developers to distribute with their own stacks. Programmers can also extend Foundation's environment by adding their own tools and libraries to tailor stack development.

Building a Stack

Foundation has two operating modes: Modify lets you build or change stacks, and you can execute them with Browse. To build an application in Foundation, start in Modify mode (choose Modify from the main menu or use the F2 key) and select "New Stack" from its pull-down menu choices. A pop-up requester asks you how you want to start. The easiest method is to select "Load Setup" and load the QuickStart setup to initialize a simple stack.

This simple starter stack will have a backdrop and a first frame. The backdrop, as I mentioned above, is shared by all frames in the stack; typically, it is a graphic image into which all actions of the frames fit, such as a spiral-bound notebook whose pages are frames of the stack, or a VCR with "buttons" and "tapes" to drive a CDTV unit. Simply draw and import whatever you need. Usually the backdrop itself has few buttons or fields of its own, but anything shared by every frame belongs here (such as a Quit button or a tape name).

After defining the backdrop, start building the frame. Select "New Object" from the Edit menu, or use the Escape key, to create an object and then position it with Foundation's crosshair cursor. Size it, add text and attributes to it, and you have a button, field, or slot for an IFF graphic.

Scripts

Once you're happy with your object's appearance, you can edit its script by double-clicking on its icon or through the Edit Script menu choice. An object's script, written in Foundation's FAST-Talk language, is a series of one or more event handlers for each event. The most typical one is "Select.Up," which sends information to the object when a user holds down and then releases the left mouse button after the mouse pointer has been positioned over the object. For example, a button labeled "Pause" on a tape-player frame might have the Select.Up handler shown in Figure 1.

```
Select.Up:
 IF PAUSED.TAPE IS 0 THEN
   –Tell the user we're pausing, then pause
     the CD
   PUT "Pausing Tape..." into LCD.Msg.Area
   CD.PAUSE
   PUT 1 INTO PAUSED.TAPE
 ELSE
   — Un-pause the tape, clear the message
   PUT "Playing..." into LCD.Msg.Area
   CD.RESUME
   PUT 0 INTO PAUSED.TAPE
End_Select.UP
```

Figure 1.

In the example described in Figure 1, "Select.Up:" and "End_Select.Up" bracket the handler. The handler itself uses the global variable PAUSED.-TAPE, belonging to the stack, to remember whether the Pause button is down or up; it then either pauses the CD player with CD.PAUSE or releases it with CD.RESUME (both FAST-Talk statements). The handler also puts text into another object on the frame, an "LCD display" object named LCD.-Msg.Area, to tell the user what was up.

Frames also have scripts to initialize globals, do special effects on frame entry and exit, and the like. Foundation supplies 16 visual effects, including curtain-style openings and closings, wipes, cuts, and zooms. For example, a Frame.Entry handler can open a file, load a sound into RAM, or call an XCODE routine (user-written external code) to initialize a MIDI device. Then, the Frame.Exit handler can undo or finalize any of these actions not specifically handled by objects in the frame. It is invoked when the user jumps to another frame.

The stack as a whole has its own script with handlers, as well as special Stack.-Entry and Stack.Exit events. Lastly, scripts can live in Libraries (outside of all stacks) as named scripts with handlers that are linked to a script in the stack, or as tools used to develop application stacks.

Properties

Objects have a number of properties: contents, color, text style (if applicable) or IFF image, location, size, visibility, and even script. All of these can be manipulated by FAST-Talk. For instance, the Select.Up script shown in Figure 1 changed one of the properties of the LCD.Msg.Text—its "care ontents." As another example, to make an image appear for a few seconds and disappear again when another object is click-selected, you would turn its "visibility" property on and off (see Figure 2).

```
Select.Up:
 set the visible of object.45 to 1
 delay 7
 set the visible of object.45 to 0
  — Say Gone Again, somewhat more
     phonetically.
 say "gawn agin"
End_Select.Up
```

Figure 2.

This causes object.45 to become visible for seven-tenths of a second, and then to become invisible again (finishing with an appropriate sound effect). The visibility attribute is also useful for animations and for hiding fields or buttons that are suitable at one point in a frame, but are otherwise inappropriate.

One property useful in multiline text objects is hypertext, a list of words and phrases with associated actions. A multiline text object can contain paragraphs or even pages of text through which a reader must scroll. It would be painful to make each special phrase a separate object with its own Select.Up handler, especially if that phrase is repeated in the text. Therefore, when Foundation displays the text, it can highlight or color the specified hypertext words (using the HYPERTEXT.COLOR and HYPERTEXT.STYLE properties). Whenever a user clicks on one, it will look up and perform the action (such as jumping to another frame).

Customized Application Development

One of Foundation's better features is the degree to which skilled stack designers can improve their working environments. Foundation's macro recorder lets you record a standard series of actions used for building objects, save it, and install it on a menu as a tool. Foundation provides a set of standard script builders for building scripts to show pictures or play sounds. What's more, you can add your own script builders to automatically create entries for commonly used actions. You can add Tool scripts to the development set that handles system events such as SYS.NEW.OBJECT or SYS.

Continued on p. 86.

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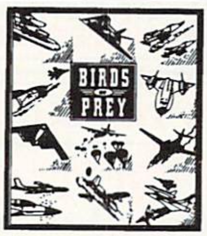
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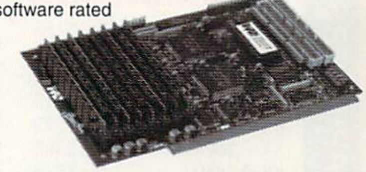
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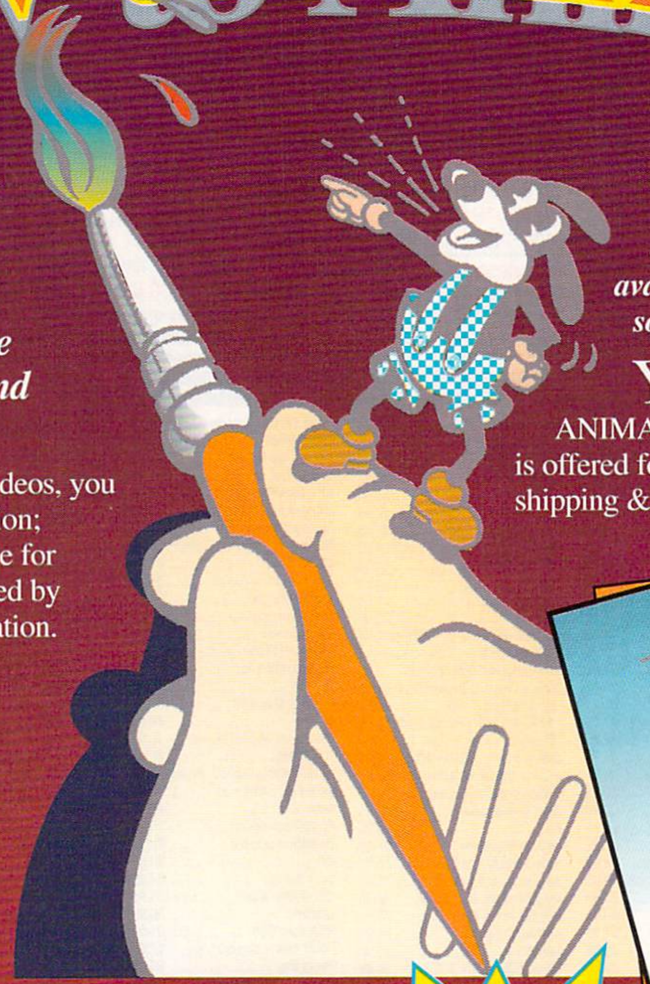
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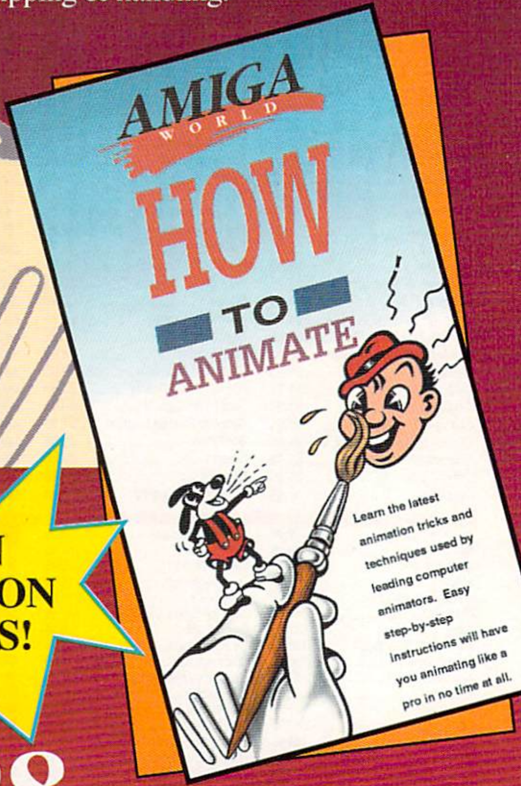
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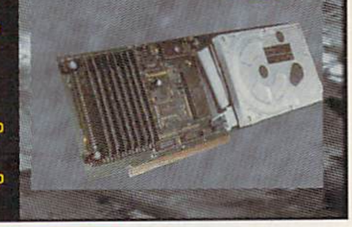
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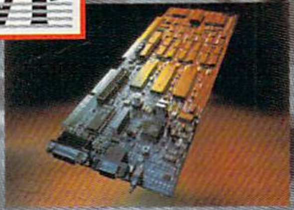
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Circle 13 on Reader Service card.

From p. 78.
MODIFY, normally handled by Foundation itself.

Another of Foundation's strengths is the program's on-line documentation and hyper-help. Every FAST-Talk feature, every object property, and almost everything else present in Foundation is available via two easy-to-reach forms: the Encyclopedia and the HyperView stack. The Encyclopedia provides a topically indexed front-end to this information, most useful for browsing. The HyperView stack, available via the Help key in Modify and Browse modes, provides quick string-search lookup of given topics and a way to copy an example from the topic description into your stack. These two features eat up quite a bit of memory, but they're really useful—much more so than the manual.

Speaking of memory, we come to one of Foundation's two weak points. For a disk-based card/stack system, the program requires a lot of memory. My 2MB A3000 ran out of memory within 5 to 15 minutes every time I was developing a stack. I had to exit and then re-enter the program on each occasion. I would need another couple of megabytes to do any serious work with Foundation. The program warned me when memory was running short. Once—after I ignored the warning—the machine hung up.

The other weakness of Foundation is its manual. It appears to be the on-line encyclopedia text dumped onto paper, with no real table of contents and an index that tells you only the section a topic is in, not its page number. I stuck Post-It tape flags on all sections so I could find them later. I hear another manual is forthcoming, and I hope it will be better. At least, Impulse includes a decent tutorial section at the beginning of the present manual. Use it, because it contains information not found elsewhere in the manual.

WHAT NEXT?

All in all, Foundation is a decided improvement over UltraCard. It's not UltraCard on steroids, or UltraCard full of hot air; it's a better product. If you have previous experience with UltraCard, or have worked with a similar Mac or PC product, you'll find many parts of Foundation familiar and useful. Only time will tell whether Impulse will finish smoothing Foundation's rough edges and write the reference manual it deserves, and whether it can appeal to the audience CanDo and AmigaVision already enjoy.

FINAL COPY

SOFTWOOD

For neat rivulets of text.

By Dave Johnson

FINALLY, A REASON to get excited about word processors again! ***SoftWood***, the developers who brought us Pen Pal and Electric Thesaurus, has come up with a powerful, easy-to-use, full-featured word processor that rivals just about anything available for the Amiga.

FORM AND GRACE

Final Copy ($99.95) installs effortlessly on your hard drive, thanks to an installation program originating, I understand, from Commodore. In addition, Final Copy's spiral-bound manual is attractive and functional, featuring a well prepared tutorial and reference section.

The program itself is a joy to configure and use. Word processors should be attractive as well as intuitive, or else they interfere with the often difficult task of writing. Final Copy, for its part, opens either directly on the Workbench or on a custom screen (interlaced or not) with subdued colors and an attractive 3-D appearance. The ruler is a little large, but with it you can set margins, tab stops, text justification, and hyphenation for the entire document or specific paragraphs. You can set these text-format features to desired defaults via requesters in the pull-down menus.

Speaking of defaults, Final Copy provides a dizzying number of preferences, which are broken into modular units. Separate preferences allow you to configure page setup (page size, number of text columns, header and footer specifications, etc), display (text resolution on screen, graphics colors, invisibles), document (time-and-date format, tab stops, etc), paragraph (indent size, line spacing, justification), and graphics (text flow, border, etc), just to name a few. Each preference module can be set as the program default or just for the active document.

WHAT YOU SEE...

Final Copy comes with all of the bells and whistles you would expect to find in a good WYSIWYG word processor: The program optionally displays a border indicating the specified text margins and legal printing area for your printer. Headers and footers—when used—are displayed on-screen. A very nice variable display feature allows you to view the document at 25% magnification (two pages on-screen at once), 50% (page preview), 75%, 200% and 400% (for a mightily magnified view of just a few characters). In all display modes, the program scrolls rapidly, faster than anything else I've seen. Moreover, I couldn't out-type it. This is one quick program, no matter how you measure it.

Final Copy's text-handling features include an integral spelling checker and thesaurus. The spelling checker not only flags misspellings but also errors such as sentences that begin with a lowercase letter. I was only disappointed that you cannot make changes by double-clicking on recommended words; instead, you must select a word and then hit the Replace gadget. As if to make up for this shortcoming, Final Copy allows you to edit your document while the spelling requester is on the screen. This is a tremendously convenient feature, in itself nearly worth the price of the program. The thesaurus functions just like SoftWood's stand-alone program, Electric Thesaurus, which is fast and abundantly suggestive. I'd like, however, to see SoftWood link the two utilities in the same requester in a future release.

Final Copy provides a hyphenation-control feature that lets you determine at what point on a line words become candidates for hyphenation. You can entirely disable this function if you wish.

Let's not forget that Final Copy is a graphic word processor: You can import both brushes and full-screen graphics—HAM included—into your documents. Further, there is no restriction on where you place them, and you can resize and even crop them within documents. You can also arrange multiple graphics by depth, as well as control how they overlap.

Final Copy lets you flow text around graphics. This means you can set text to flow to the right or left of a graphic, and between two images by setting the left image to a right contour, and the right image to a left contour. If you like, you can also instruct the program to render a border around the graphic, with thickness of up to 12 points.

One innovative preference setting allows you to save graphics with the document (as most programs do) or just the link. This option simply stores the path to the graphic with the document, eliminating the need to waste disk space with another copy of a graphic elsewhere on your disk. Take care, though; if you later move the graphic, Final Copy will not be able to load it into the document. Overall, the program's graphic handling is superb,

although I would prefer to be able to turn pictures off on the screen display.

Final Copy's extensive ARexx support has room for ten ARexx macros and features over 70 commands that mimick most program controls. It would be nice, however, if SoftWood allowed you to rename macros to something descriptive; it would be much easier, for example, to select a macro named "Format" from the menu rather than try to remember which functions are called AMacro_1, AMacro_2 or AMacro_3.

...Is What You Get

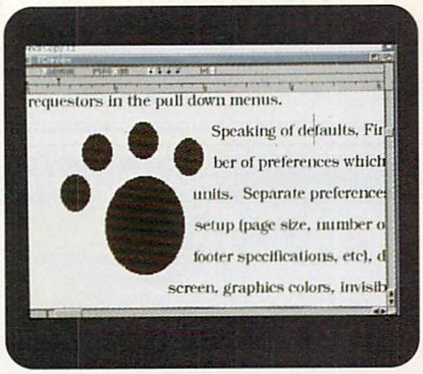
Now we get to the real reason Final Copy exists—output. With its own driver and fonts, it directly supports PostScript output, but even that's not the best news for most of us. It also produces truly breathtaking output on a laser printer, as well as excellent dot-matrix results, because it uses proprietary Nimbus outline fonts instead of bitmapped system fonts. While over 30 typefaces accompany the program, they are largely italic and bold variations of nine basic fonts. These, by design, mimic PostScript types like ITC Bookman, Helvetica, and Times. These fonts work on any printer, and produce great hard copy in any size from four to over 200 points.

Perhaps because Final Copy was hand-tuned to the Nimbus fonts, output is miraculously fast. I printed the first page of this review using Final Copy and again using the outline font capability in ProWrite 3.2. I found that ProWrite took nearly four minutes to send a single page of text to my laser printer, while Final Copy took little more than a minute.

The down side of all this is that Final Copy supports neither the Amiga's bitmapped system fonts nor Workbench 2.0's outline fonts. While I'd ordinarily condemn this as shortsightedness, I'm just too happy with Final Copy to complain. The included fonts are sufficient for the vast majority of word-processing tasks. Bear in mind that this is a word processor; if you are interested in producing magazines, buy PageStream (Soft-Logik) or Professional Page (Gold Disk). In future releases, however, I would like to see the program offer support for the Amiga's new standard by incorporating Compugraphic in addition to the Nimbus fonts.

A Hard Act To Follow

Final Copy is a formidable program, but it is not without a few rough edges. While I never lost data, Final Copy's



Text flows automatically around this graphic in a document that's viewed at 200% magnification.

display became temporarily corrupted on rare occasions, under conditions I couldn't duplicate. Additionally, Final Copy insists that you specify headers and footers before creating them. As for the outline fonts, SoftWood tech support couldn't tell me if there are plans to incorporate them in future releases. Finally, the outline fonts were not optimized for display, and, at 12 points or less, they are difficult to read. Despite these criticisms, Final Copy is a program to be reckoned with. If you tend to output your work directly from a word processor (without an intervening desktop-publishing program step), I wholeheartedly recommend Final Copy.

Editor's note: The latest version (1.3) of Final Copy contains modifications to the outline-font engine that greatly improve the readability of text on the screen.

Video Director

Gold Disk

Move over, Fellini!

By Michael Hanish

IF YOU ARE looking for a small-scale video setup, you will appreciate **Video Director** ($199.95, ***Gold Disk***). This software-based edit controller and tape librarian works with one infrared-controlled deck and another that has a LANC (Control-L) jack. With Video Director, if you already have a camcorder and a VCR, you can create edited sequences at home.

You use Video Director to identify the sections of the videotape you want to assemble. Your Amiga keeps track of the start and end points of these sections, or "clips." Once you define a number of clips, just place them in order, and the program automatically copies them to a master. The program also maintains a sortable, printable database of all the clips and tapes you catalog.

The program uses the source and record decks' counter numbers or elapsed time to track the clips and edit points. This method is universal among consumer-grade camcorders and VCRs, and is inherently less accurate than audio track-based time code. Fortunately, Video Director uses several methods to ensure calibration, minimizing the difference between counter time (relative) and tape time (absolute).

The hardware part of Video Director consists of two cables for control and communication, one from the serial port (LANC) to the source deck, and one from the second mouse port (infrared) to the record deck. The LANC, or Control-L connector, is a miniplug standard developed by Sony and supported by Canon, Ricoh, Pentax and others. Other supported possibilities for source decks are Panasonic's AG-1960, Selectra's AG-1960RS, NEC's PC-VCR, and Sony's V-Box control system. Some of these require an adapter, available from Gold Disk.

My hardware setup for these tests consisted of a Canon A1-Digital camcorder as the source and the AG-1960 for recording, both of which worked exactly as promised. I also tried other combinations of suitably equipped machines and found all to work smoothly.

Up and Running

To install Video Director's hardware, simply plug in the cable and install the proper driver, using the included utility program. You will need to teach the program a set of remote codes and set up edit-deck control, so aim the mouse port cable toward the deck's remote sensor window.

Software installation is as simple as dragging the Video Director drawer from the program disk onto your hard disk. While the program runs well from floppy, it is best suited to hard-disk residence for speedy access to the tape library and clip list. Once you connect the source and record VCRs, following the diagram on the program disk, connect your genlock, if you have one, install the drivers, train the remote, and you're ready to edit. On-line help is available at all times should you be separated from the very clear manual.

Video Director's control screen contains transport controls for both source and record decks, and a button to

Continued on p. 90.

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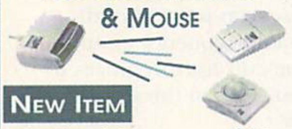
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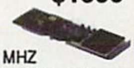
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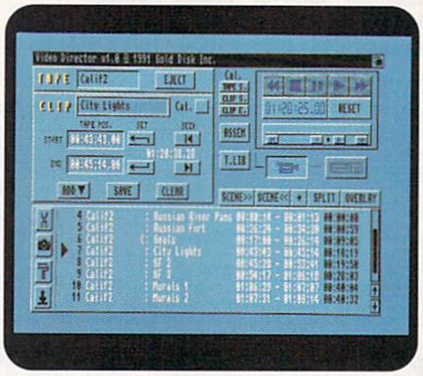
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From p. 87.
toggle between the two. The bottom half of the screen contains the clip list, also known as the edit-decision list. The first step in the editing process involves defining clips from the source tape or tapes. This is done using the on-screen transport controls and buttons to mark and label the start, end, and name of the clip. As soon as the end point is entered, the clip is automatically saved to the tape library. You have the option of adding each clip to the decision list as you go, or later on from the library list.

If you are working from multiple source tapes, you must let the program know that you have ejected and changed tapes. It will remember the current location of each tape, unless it has been recalibrated (about which more below). The tape library contains all the clips you have ever defined, with start and end times, comment, and the name of its source tape. You can sort this list by tape and/or clips and print it for reference.

Once you have defined enough clips, you can arrange them into the final edit order by cutting, copying, and pasting with the tools on the clip list. You can also import, export, save, load, or print ASCII text.

Video Director functions in either automatic or manual mode, depending upon your configuration and requirements. For automatic assembly, you must first set the preroll time on the record deck, which always takes some experimentation. Preroll is the amount of tape time it takes for the deck to kick into record mode, and this varies from model to model. With an inaccurate preroll setting, the record deck will not cut in at the proper time, thus spoiling the beginning of the edit. The manual contains a simple way to calibrate for accurate preroll.



Assemble and catalog your video footage with Video Director.

Once set, the program saves this parameter as an option. Afterwards, it is just a matter of pushing a button and watching the program assemble the edit. The program prompts you to insert different source tapes as required. If you have defined overlay events, the graphic will be shown on the Amiga's monitor while the associated clip is being edited; otherwise, the monitor goes blank for the duration to keep you from accidentally recording the control screen as a graphic.

Since the program does its source-tape positioning using fast forward, reverse, and picture scan based on tape-counter information, there will always be slippage. This means that the actual tape position will vary from the position the predefined clips have specified. Video Director kindly allows for several different sorts of recalibration to keep edit points as accurate as possible. You can even program calibration into the edit sequence as an event, so that the edit list recognizes it and prompts you to align the source tape accordingly.

When Video Director is unable to communicate with the source deck, it must operate in manual assembly mode. In this case, the program acts as an instructor, prompting you through the steps and positioning of each edit. It is a reassuring help, but really nothing that you couldn't accomplish without the program. Unfortunately, manual mode works without the benefits of preroll time, so accuracy suffers.

The program comes on one non-copy-protected disk, with cables and a clear and thorough manual. Before purchase, however, consider your equipment. Video Director is a tremendous help to those with lower-end equipment, but make sure your gear provides the required connections. Consider also whether you want to have your Amiga tied up with edit-controlling chores; there are a number of adequate stand-alone edit controllers that fulfill the same functions as Video Director, but without the tape-library feature. While Video Director's features are not all that unique in the marketplace, its price and performance levels set it apart, making it worthy of serious consideration by videomakers using consumer equipment. ►

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BACKTALK

CANDID RESPONSES TO *AMIGAWORLD* REVIEWS

Clicked Off

We emphatically support and agree with the *AmigaWorld* review on the Black Belt ClickFAX modem and software (see Dec. '91, p. 88).

We have used the Amiga in our business since 1985 and are experienced 3-D animation, spreadsheet, and desktop-publishing users.

We purchased a ClickFAX modem after seeing a brief note in *AmigaWorld* announcing its release, and we have been frustrated and displeased ever since.

In its "News and Views" rebuttal of the *AmigaWorld* review, Black Belt makes accusations about the abilities of the reviewer, with whom we agree. Is it necessary for us to become programmers to use this or any other product developed for service industries? Truly, Black Belt is not sensitive to the needs of their current and prospective customers.

It is not our responsiblity as users to be able to figure out ClickFAX on a programmer's level, using a sparse and unnumbered manual and complicated and wordy "ReadMe" updates. What's more, Black Belt's technical support is as elitist in its responses and as difficult to reach as the White House.

We have called, or, shall we say, attempted to call tech support at Black Belt approximately 15 times during the hours noted in the manual. It is not our fault the hours were changed and we were not informed. After we found out, we called during the new hours one-half hour after opening, only to find they were taking a "late lunch" and were not available. This is ridiculous!

It seems fantastic to us that we then had to purchase PageStream at a cost of several hundred dollars in order to send DTP faxes and to export IFF files. We were told this neither upon ordering nor when requesting information regarding ClickFAX before purchasing.

We are definitely not confident that we will receive faxes with ClickFAX running; all we wanted to do was to send our DTP scripts via fax and receive corrections. It has been a hassle, and, quite frankly, unless ClickFAX responds, we are going to buy a fax machine.

Gayanne DeVry
David K. Vandam
Austin, Texas

Just the Fax

In response to Ben Williams' BackTalk letter that appeared in the February issue, I can understand Black Belt's unhappiness with my ClickFAX review. I very much dislike writing negative reviews, especially for a company whose other products I greatly respect. I spent more time on ClickFAX than I have on any other review, and I was very thorough.

It is true that some of the problems I had were due to the fact that I did not possess the most current version (even though I was working with an upgraded release version of the product), but since Black Belt constantly updates its software and it did not send *AmigaWorld* significant updates, it was impossible to keep current.

AmigaWorld does check facts just before going to press, and Black Belt had the opportunity to comment on feature changes or bug fixes (as they did in the editor's note at the end of the review). Another problem is with the company's help line, which is available only two hours a day, and I have called repeatedly only to listen to busy signals.

Ultimately, I still feel that ClickFAX is awkward and lacking in features, especially when compared to the lowest-level products in the Macintosh and IBM markets. Yes, this is a fair comparison, since I was comparing it to very basic products, not the state of the art. The Amiga market does not exist in isolation, and I would have no problem with the price (economies of scale aside) if ClickFAX were a better product.

I have no problem with the quality of the end result; my quarrel is with what you have to do to get there. It is ridiculous that you must purchase and learn PageStream simply to create pages with multiple fonts and graphics that you can then send through ClickFAX. Professional Page cannot save a page as a superbitmap as does PageStream, so you cannot use it.

Since ClickFAX's text conversion for use with word processors is ASCII only, you lose all of your formatting, so I heartily disagree that it works well with text editors. Truncate would make sense if it continued each line straight across to the next page, but in my version it only cut off the rest and stopped at a single page. The wrap function did not word wrap, and I was using plain vanilla ASCII from TransWrite. While these bugs should be fixed by now, purchasers should not have to wait for upgrades to repair such basic features.

This is the first time that I have heard a company complain that a product would be "burdened " with additional features. Their Imagemaster image-processing software, one of the better products in the Amiga marketplace, overflows with features and options, and far from its being burdened, I feel it is enhanced by such additions as a paint program. It has one of the best integrations of ARexx macros I have seen to date, and does not make you write your own macros as substitutes for integrated features. Instead of spending so much time defending ClickFAX, I really wish Black Belt would bring it up to the level of their other fine products. I would then happily purchase it.

Geoffrey Williams ■

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AW Shucks!

Item: In our 1992 Special Issue, the article "References and Resources," by Steven Blaize, included (on p. 121) a listing for Steve Worlie's Imagine BBS. This was based on information that has proved to be incorrect, as Mr. Worlie tells us he has no BBS. We apologize to Mr. Worlie for the annoyance this has caused him, and we beg our readers not to call the listed number, which is Mr. Worlie's private home telephone.

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TSP9: Utilities #1 *IconMeister*--an Icon editor with a complete set of editing/painting tools. *TJFormat*--a disk formatting program that will format disks that AmigaDOS wont. *ChartMaster*--a graphing tool that allows you to generate and save different graphs in IFF format. *Graph3D* lets you visualize complex data in 3-D and save the results. *StructGen* lets you create gadgets, text, bitmaps and window structures and the program will automagically write the "C" source code for you. *LabelMaker* is a very easy to use, full featured label printer. *DoublePrint* fascilitates printing of text files on both sides of paper.
TSP8: Clipart Black & White and colorful clipart for a variety of needs including desktop publishing/video. People, holiday related, school items, scrolls, food, monsters, fish, lobsters, symbols and lots more.
TSP7: 3D Vector Objects #2 Books, Early American telephone, barrels, gun, spaceship, lamps, trombone, bugle, skateboard, Lego-Rover, remote control, glider and airplane. All objects in Sculpt format.
TSP6: 3D Vector Objects #1 Lamp, mirror, bed, chair, fire hydrant, lamp post, street lamp, street sign, traffic light, cannon, cannon supplies, rose, fork, spoon, knife and plate. All objects in Sculpt format.
TSP5: Games 3 *CrossCircuit* is a one or two-player action/logic game that requires fast reflexes. *WordSearch* will allow you to generate your own word-search puzzles. In *DrugBusters* you rid the streets of cigarettes, alcohol, pills and needles. In *Cinco* you try to get five X's in a row before your opponent. *ColorLogic* is an excellent MasterMind type game.
TSP4: Games 2 *Dyno-Wars*--a strategic checker-style game. *Kooties*--assemble a bug before the computer beats you to it. *BlockBuster* is a colorful, well done Tetris-type game. *Warrior* is a full shoot'em-up adventure game. *MicroMan* is a graphic maze game played with a joystick. Battle the computer's armies to take over the planet in *Circe*.
TSP3: Games 1 *Crystal Caverns* is a clone of the arcade game--colorful, complex graphic adventure game. *Dot2Dot* is an adaptation of the classic 2-player connect-the-dot game. *PizzaDeliveryMan* has you running through the streets to get those pies to your customers. *TinyBall* is the world's smallest baseball arcade game. *Surround-Cycles* is a high-speed arcade game, loosely based on the light cycle races from the Disney movie Tron.
TSP2: Sounds Animal sounds, musical instruments and many, many more--43 sound samples in all!
TSP1: Maps of USA, Canada and Europe Hi-Res IFF brushes of all 50 US States, 10 Canadian Provinces and countries in Europe. Each map has a 3D extrusion effect with cast shadow.

Special Thanks

TC33: Measures 1.0 is an incredibly useful utility that will convert any type of measurement to another. *DiskLabeler* is a database designed for storing and printing 3." disk labels. *Jewels* is a Tetris-esque game of action and strategy. *Switch* is a fun board-game. *Gfxclipper* will allow you to grab any screen and save it as an IFF picture. *Softball Manager* is a database for storing stats for softball--any number of leagues may be tracked. *WBExec* allows you to execute CLI commands from within the Workbench. Several *Clipart* images are also included.
TC32: *Computer Coloring Book* is a delightful program for children of all ages--comes with 15 pages of pictures to color again and again. *Listmaker* lets you make, edit, combine and print lists of words--great for those spelling tests! *Moresmooth!* scrolls text files smoothly on the screen and allows easy printing. *Pocket Billiards* lets you choose from several of the most popular pool games with realistic action. *Texture* allows you to create, manipulate and save (in standard IFF format) realistic fractal textured surfaces. *Plague* is a monster maze game. Also includes *Screen Fader*, *Snowbench*, and *FlipBench*.
TC31: *Calendar Publisher* is a professional-caliber calendar maker that is customizable. *CrossCircuit* is a 1 or 2 player action/logic game that calls for fast reflexes and thinking. *APR* is a much-needed printer utility. *Pizza Delivery Man* is a maze game where you deliver pies in your neighborhood. *Multiplayer* is a single program that will let you see IFF pictures/brushes or playback IFF sound samples. Also includes *RAMgauge*, 3-D vector objects and Hi-Res IFF brushes of maps and flags of European countries.
TC26: *Word Search Maker* lets you create word-search puzzles. *TimeCalc* is useful for anyone who has to calculate hours and minutes (great for adding up times of CD's to make tapes!) *Drugbusters* is a fun game where you get rid of cigarettes, booze, pills and needles. *Wordfinder* lets you search binary or text files for a particular word or string (good for getting hints in your adventure games!). *KeyClick* will add a small audible click to your keys and *MouseClick* will do the same for the mouse buttons. *Seawar* is a game between the Allied Navy and the Empire Fleet. Plus Early American 3-D vector objects, digitized sound effects, and a directory program.
TC25: *ScreenToIFF* captures your screen to an IFF file. *PopColors* lets you change the colors of your Workbench screen. *Warrior* is a fun shoot'em-up/adventure game for one or two players. *Kaleidoscope* is a line drawing program. *Blockbusters* is a game where you get rid of blocks by pushing matching blocks into them. *Amidemo* will show-off your Amigas ability to do solid-polygon animations. *Microscope* lets you examine memory at any location. Also includes Hi-Res IFF brushes of all 50 states and 10 Canadian provinces, nine digitized sounds and two small disk utilities and printer utility.
TC24: *TableMaker* is a tool for effortlessly building numerical tables. *Kooties* is a fun game where you have to assemble a bug before the computer beats you to it. *HyperText* lets you put links in a text file to other text, graphics, sound, animation, ARexx and other applications. *The Little Black Book* is a wonderfully useful telephone and address book. *Color Logic* is a MasterMind-type game. Also includes several disk and memory utilities---and some animal sound effects to top it off!
TC23: *Wherels* lets you quickly and painlessly find a misplaced file on your drive. *Select* creates a window from which you can run your favorite programs. *MatheMagic* lets you find the day of the week for any date in the century, also lets you enter statistical data to be analyzed, graphs data, and solves linear algebraic equations. *Pointer List Maker* lets you create your own pointers or import pointers from other programs and save them in a disk file. *Dyno-Wars* requires more strategy and thought than your regular checker board game. Also includes *Mr. Monster* and *Trilion* games, 3-D objects, six sound effects and an animation of a pretzel!
TC22: *Amiga Checkbook* is a fast checkbook manager with check printing ability, budget analysis, and a report writer. *AmiCrypt* is a file encryption/decryption tool to password-protect any file...a **must** for security. *WaveSyn* lets you design musical instruments and waveforms for use in other programs. It also lets you play your keyboard like a piano. *Cinco* is a game where you try to get five X's in a row before your opponent does. *AlterCLI* lets you change attributes of your CLI window (width, title, depth, height, location, colors) with a single command--very useful for scripts. Also includes an animation by renowned Amiga-artist Lou Markoya, as well as 3-D objects.
TC21: *Circe* is a "risk-style" game where you battle the computer to take over the planet. *Batchman* allows you to execute CLI programs, batch files and ARexx scripts by simply clicking on a gadget. *Colors* prints color test sheets and assigns RGB values to printer and screen output....absolutely invaluable to achieve the best color printing results. *Easyfile* is a powerful database for home or a small business. *Sprite Editor* lets you easily create animated sprites. Plus 3-D fruit objects and five sampled sounds.
TC16: *Cyberscape* generates complex 3-D vector objects of terrain and saves your objects in Sculpt or Turbo-Silver format. *Mathplotter* graphs mathematical equations in both 2-D and 3-D. *Double Print* prints your text files on both sides of the paper. Also includes *Metamorph*, a graphic adventure game, *Tinyball*--the worlds smallest baseball arcade game) and six digitized sound effects.
TC15: *Labelmaker* is a very easy to use label program. *SurroundCycles*, a high-speed arcade game. *Dot2Dot*, an adaptation of the classical connect-the-dot game. A tutorial on animation techniques by Amiga-artist extrordinaire Brad Schenck complete with one of his animations. Also includes a collection of clip-art and more animal sounds!

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TC14: *AmigoFile* is a database and address book. *Graph 3-D* lets you visualize complex data in a 3-D manner and save the results. Spectrogram *analyzes and displays digitized sounds. Pteronadonaball*--an animation by Lou Markoya. Also includes *3-D Tic Tac Toe*, 3-D objects, food clip-art, and sampled sounds.
TC13: *StrucGen* lets you create gadget, text, bitmap, and window structures and writes the C source code for you. *LifeCycles* plots your biorhythms. Create spectacular images with *Mandelbrots*. *Look*, a CLI utility that helps you find files on your disk quickly and easily. Plus 3-D objects, holiday clip-art, an Amiga Flight animation, drive head cleaning utility, and technical discussion on how AmigaDOS stores information on disk.
TC12: *TJFormat* formats disks that AmigaDOS normally wont. *ChartMaster* is a powerful graphing tool. *MoreCandy* generates an assortment of colorful graphic patterns and allows you to save them to disk. *Shark*, a game where you have to eat all the little perch you can catch to stay alive. Plus B&W clip-art for desktop publishing, spaceship 3-D vector objects, an animation, and Speakeasy (C source code for the programmer who wants to add speech to C programs).
TC11: *DiskSalvage* will fix corrupted disks and recover deleted files. *IconMeister* is an advanced Icon editor. *AlienDuel* is a fast, shoot'em-up game. *Crystal Caverns* is a colorful, graphic adventure game like the arcade game. Also includes an animation, sound samples, 3D dinner table objects, and Hi-Res monster clip-art.

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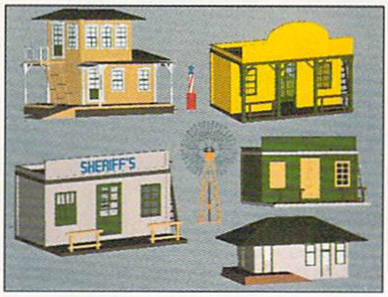
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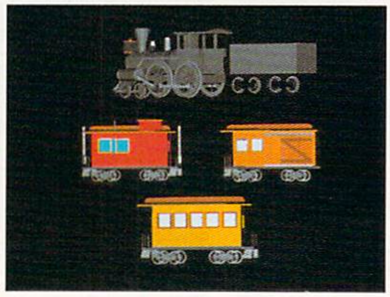
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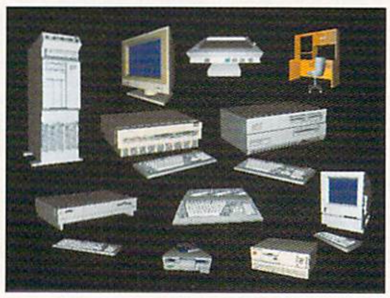
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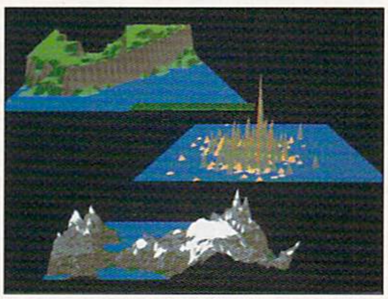
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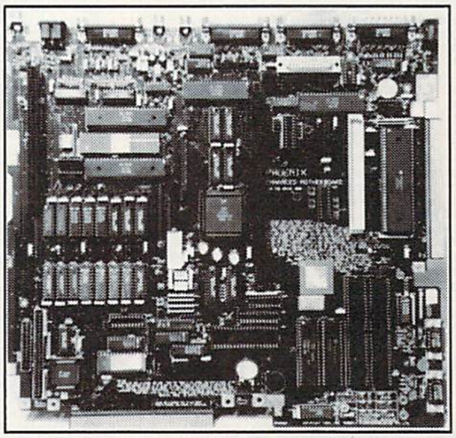
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FD74: Arcade Series - RingWar is an "Outer Limits" clone with vectorized graphics. MotherLode is a "Lode Runner" clone with 50 levels! In BlitzTanks, they're coming at you from all directions!! Call in air strikes and use your heavy artillery to survive!
FD73: Arcade Series - Intruder Alert! is a MULTI-level "Berserk" clone. Features smooth gameplay, great graphics & digitized sound f/x.
FD72: Sword of the Warlock - This is a demo version of a great public domain graphic dungeon adventure game. The adventure spans three diskettes and allows two players to go adventuring. The game has a 'Bards Tale' feel to it. Three disk set, counts as 2. Requires 1 meg of RAM and 2 floppy drives or HD.
FD71A&B: Star Trek: TNG Trivia Challenge - So you think you know *The Next Generation*, huh? Complete with *fantastic* sampled sounds and digitized images, this game even looks and sounds like a genuine Star Trek terminal! VERY thorough and complete! Counts as 2 disks.
FD70: SpaceGames - Contains AmiGoids, >finally!< an Asteroids game that takes advantage of the Amiga--totally configurable with great sound and grpahics. In Cosmostruction the object of the game is for each Cosmostruction team to acquire the most points while construction energy ducts between the space station and planetoids.
FD69: MindGames - Had enough of shoot-em up blasting games? Relax and let these 21 games exercise your mind instead of your wrist.
FD68: Potpourri - Eternal Rome is a strategic simulation of the Roman Empire including military, diplomatic, political, economic and social factors. Lord of Hosts is a board strategy game for 2 players. In Moonshine, you've got to get the hootch across the state line--a great rolling, scrolling driving game!
FD67: Arcade - Includes Llamatron a well-done 'Robotron' clone. Hate is a "terrific" commercial grade Zaxxon clone with multiple levels/worlds and smooth diagonal scrolling...a 10!
FD64: Games - Wizzy's Quest - a "great" 50 level game with great graphics, Cubus - a 3-dimensional Tetris type game (rotate and move in 3 dimensions). Husker Du - Colors and pattern rather than shape in this Tetris-esque game; 5 screens and 3 levels of difficulty. Requires Fat Agnus (1 Meg of Chip)
FD62: PomPom Gunner. An extremely smooth and well done World War II gunner simulation. Requires 1 megabyte of memory.
WB111: Cellular Automa - Straight from the pages of the January 1990 issue of Scientific American, this electronic model will allow you to simulate cellular circuits.
WB110: Electronic Baby Book - Immortalize your children on your Amiga! Tracks everything about your newborn--first steps, words, tooth, birthdays, X-mas, friends, etc--even space for a digitized photo!
WB109: VerseWise - Display, search and output The New Testament to text files or your printer.
WB108: OctaMED - This breakthrough program doubles your Amiga's sound capabilities from 4 channels to an ear-popping 8 channels! All the renound editing capabilities of MED plus 4 more channels! If you thought your Amiga sounded good before...you aint heard nuthin' yet!
WB107A&B: Educational - Drawmap is a program that generates representations such as hemispherical views, and orbital views of the Earth's surface, complete with national boundaries. Screens can be printed or saved to disk as standard IFF files. Full user-configurable online help facility. 68020+ version included. 2 disk set, counts as 1!
WB106: Home Manager - This is a great all-in-one address book with an autodialer/notepad/to-do list/appointment scheduler/home inventory database and phone number dialer. *Slightly* crippled demo version.
WB105A&B: Workbench 2.0 Extras #2 - See the top right of page 2 for more info on these priceless utilities to make Workbench 2.0 fly!
WB104: GrabBag - Q&A Trivia (requires AmigaVision) is a trivia game for 1/2 players...add your own questions to customize the difficulty level! Sysinfo is great for telling you how fast/slow your computer is, what boards are installed, chipsets, etc. AmiGazer will plot stars in the heaven from any position on earth complete with magnitudes and constellation identification.
WB103: Music - Contains 12 "great" Soundtracker/MED music MODules...complete with programmable/shuffle player...8 bit audio never sounded so hot! Two disk set counts as two.
DD84: Proteus BBS - This disk contains the full-blown version of the Proteus BBS software. Totally configurable & ultimately powerful. Requires a hard-drive for realistic use and at least a meg of memory.
DD83: IBM - This demo, IBeM, will allow the running of MS-DOS software with Amiga programs!!! Comes complete with programs to turn your Amiga floppy drives into 720K IBM compatable drives.
DD82: Unix - Contains a working demo of Minix - a Unix workalike. Minix is system call compatable with V7 of Unix.

Other Great Disks

FD5: Tactical Games - BullRun - a Civil war battle game, Metro you play the role of a city planner. Build wisely and your system will be a success, but poor planning will lead to disaster and financial ruin. Very very habit forming.
FD6: GAMES! - This disk is chock full of games including; Checkers, Clue, Gold - A new slide the pieces puzzle, Jeopard - An enhanced version of Risk, RushHour - Surprisingly addicting, and SpaceWar - Best described as a cross between Combat-Tanks and asteroids.
FD7: PACMAN - This disk contains several pacman type games including; PacMan87, MazMan and Zonix.
FD9: Moria -. This has great graphic controls, multiple spells, similar to Larn and Hack. Play time several weeks!
FD10: HackLite - A dungeon adventure game. Considered a must-have classic. This is the second release of this game on the Amiga. Great graphic interface. Play time several weeks!
FD11: Las Vegas and Card Games - Las Vegas Craps - The best Las Vegas Craps simulation every written for any computer. Contains extensive HELP features, Also Thirty-One,VideoPoker and more.
FD12A,FD12B: Star Trek, The Game - This is by far the best Star Trek game ever written for any computer. It features mouse control, good graphics, digitized sound effects and great gameplay. Counts as 2 disks. Req. 1Mb and two drives (or hd).
FD13: Board Games - contains multiplayer Monopoly, Dominoes, Paranoids, and others.
FD14: Dungeon Master Hints and Arcade Games - DM maps, spells, item location, and hints and more, also on this disk, Hball - an arkanoid/breakout type game, Trix - a Qix type clone.
FD17: Educational Games - This disk includes several games for the younger members including geography, math, science, and word games, also includes Wheel of Fortune.
FD20: Tactical Games - MechForce(3.72); A game that simulates combat between two or more giant, robot-like machines. Simple words can't begin to give you the feel of piloting a 30 - 40 foot tall, fire breathing, earth shaking colossus that obeys your every whim.
FD26:Arcade Games - Marble_slide is a commercial quality game--similar to a Lucas game named PipeDreams, excellent playability and entertainment. Mutants--a small version of the same arcade game. SuperBreakout is a Pong/Arkanoids type game.
FD27: Arcade Games - This disk is loaded with some great games. Includes, Raceorama a great racing car game with ten different courses, MiniBlast a helicopter gunship type clone, Shark in the same class as froger, and SBreakout the original breakout with more.
FD29: Shoot'em up's - WWII - you're the pilot of a WWII plane flying through enemy territory, you've just been spotted, good luck on you mission, SpKiller - try and penetrate enemy lines with this game, and Retaliator - another great game.
FD31: Games! - Air Traffic Control - a good ATC simulation game, Black Jack Lab - a full featured set of card games, ChessTel - play chess with your friend in distant and remote places with this game and a modem, labyrnth - a well done text adventure game (like an infocom game), and MouseTrap - a 3d maze game.
FD32:Flight Simulator - Includes an instrument flight simulator for a DC10.
FD33: Arcade Games - Ffreddy a mario brothers type of game, Gerbils a target practice game, PipeLine a German interpretation of Pipe Dreams, Tron a light cycles version, and wetroids a wonderful version of asteroids with a hilarious twist.
FD35 Omega (v 1.3) - A new outstanding dungeon and outdoors adventure game in a similar vein as hack, rouge, and moria. This version is considerably faster and better that all previous versions. Play time several weeks or months.
FD37a & b:Tactical Games - Empire (2.2w) This great game comes highly recommended. With a full-graphic front end.
FD38:Games - Cribbage Master - A great cribbage game and tutor, Spades - a well done card came, ChineseCheckers - A computer version of this classic, Puzz - a slide piece puzzle game and construction set.
FD39a & b: Star Trek, The New Generation - This is a, completely different version of Star Trek than that found on FD12. This one was created by the German author Tobias. Now with English instructions. Excellent!!! Counts as two disks. Requires 512k memory.
FD44: Game - Mechfight is an out of this world role-playing adventure comparable to hack and moria. The setting, interplanetary colonies and space stations. In your quest to explore the world, take time out to liberate bad guys of their most valuable possessions, engage in a mortal combat or two against robots and alien life forms, pick up a new amiga 9000. Most of all, don't forget to stay alive...
FD49:Chaos Cheats - This disk contains an everything you wanted to know about cheat set for Chaos Strikes Back, including full maps, spells, object locations, super characters and more.
FD50: Submarine Game - Sealance, one and a half years in the making, this is an outstanding submarine tactical game. Commercial quality, highly recommended.
FD52: Classics Games - PetersQuest a well done Mario brothers type of game, Jymbc a two player missile command clone, and Vstank a tank commander game.
FD53: Great Arcade - On this disk is a wonderful implementation of the ever popular classic arcade game Defender. Also contain Air Race a WWII flying ace arcade game, and Psycoblast new creation idea game.
FD56: Arcade - Includes SpaceWar. HueyRaid is a well done helicopter arcade game. PowerPong's a great expanded pong game.
FD57: Arcade Games - Includes 2 truly commercial quality games. MegaBall, an Arkanoid-ish game, features 5 musical scores, multiple levels and addicting gameplay. Gravity Attack is a psychadellic trip through several different worlds--each distinctly different.
FD58: GAMES! - Includes Steinschlag; a great Tetris clone from Germany with music. SCombat: simulate battle between up to 40 players & monsters. Imperium Romanum: Battle up to 4 players for control of the Mediterranean in this Risk-esque game.
FD59: Game Potpourri - Xenon III is an almost exact clone of the commercial game of the same name...a great shootemup. Crossword will take lists of words & automatically generate word-search puzzles for any Epson compatable printer.
FD60: Games - In Nebula, race over a 3d world to destroy enemy installations. Interferon; a great Dr. Mario clone. Enigma; is it a gameor a puzzle?
FD61: Games - Solitaire; great graphics, plays two versions. Klide; an interesting piece of eye candy. Extreme Violence; 2 player kill or bekilled game. YATC; A Tetris clone with Artifical Intelligence. Genesis; create realistic 3d fractal worlds.
WB4:Telecommumnication - This disk contains several excellent pd communication programs designed to get you on line quickly and easily, Access (1.42) - A very nice ANSI term program based on Comm v1.34, but with the addition of transfer protocols, Comm (1.34) - Last version of one of the best public domain communications programs ever made on the Amiga, Handshake (2.12a) Handshake is a Full featured VT52/100/102/220
WB5 - Fonts #1- Several fonts (35) for the Amiga, also included are five PageStream fonts,and ShowFont - a font display program.
WB6: Video Fonts #2 - ShowFont(4.0) This program allows you to quickly and painlessly view all 256 characters in a typical font. Large AmigaDos system fonts (many up to 56pts).
WB7: Clip Art - This disk is loaded with black and white clip art. Art includes, trees, watches, tools, US and State maps, and more.
WB9:Icons - Truly a multitude of various types and kinds. Also includes IconMiester, IconLab, and others great utilities to help generate icons.
WB10:Virus Killers - The latest and best VirusX(4.0), Kv(2.1), and ZeroVirus III.
WB11: Business - Clerk(4.0), finally a full featured business accounting PD program for the small to medium company. Includes receivables, payables, end of month and uch more.
WB12: Disk Utilities - This great disk is loaded with wonderful utilities for everything including making disk labels, disk cataloging, disk optimizing, disk and file recovery archive and organizing, and all sorts of file manipulation. A must have!
WB13: Printer Drivers and Generator - over 70 different drivers, and if these don't do it, with PrtDrvGen you can make your own.
WB15: Business - This disk contains a spreadsheet, a database, a project/time management program and financial analysis (stocks).
WB16: Business - This disk contains an inventory manager, a loan analysis program, a great calendar/scheduler, a rolodex program, and pennywise a good "Cash Book" accounting for home or office.
WB18: Word/Text Processors - This disk contains the best editors. Includes,TextPlus (v2.2e) a full featured word processor, Dme(v1.35) a great programmers editor with strong macro features,TexED(v2.8) an enhanced Emacs type editor, and a spell checker.
WB20: General Interest - DiskSalv V1.42 a disk recovery program for all Amiga file systems, FixDisk V1.0 another file recovery program with features DiskSalv doesn't have, 3DLook gives a 3D appearance to your WorkBench, Clean V1.01 a program to de-fragment memory, Tracer - trace any part of an image.
WB22: Fonts #3 - Several more great fonts. These, like the other font disks work great with Dpaint and WYSIWYG word processors.
WB23: Graphics and Plotting - Plot (20b) a three dimensional mathematical function plotter. Can plot any user defined function, BezSurf2 - produce awesome pictures of objects one could turn on a lathe. Can also map iff image files onto any surface that it can draw. Now compatible with most 3D packages, and VScreen - makes a virtual screen anywhere, great for DTP .
WB25:Educational - On this disk are two programs that can generate maps of differing types, World Data Base uses the CIA's data base to generate detailed maps of any entered user global coordinates. Also Paradox a great demonstration of Albert Einstein General Theory of Relativity.
WB26: Disk Utilities #2 - MrBackup, KwickBackup - two well done utilities to do harddisk and floppy disk backups, FileMast - a binary file editor, Labelprinter - Disk label printer with very powerful features.
WB27: Nagel - 26 Patrick Nagel pictures of beautiful women.
WB29: Graphics and Sound - This disk has several different Mandelbrot type programs for generating stunning graphics. Includes, MandelMountains - a realistic terrain generator, Fracgen - generated recursive fractals from user input, Mandelbrot and Tmandel - two fast mandelbrot generators, also Mostra - the best IFF display program to date, will display ALL IFF's including Dynamic HAM, and Sound - a great IFF sound player, will play anything. Try this disk!
WB33:Circuit Board Design - several terrific routines for the electronic enthusiast, Including PCBtool - a circuit board design tool, LogicLab - circuit logic tester, and Mcad (1.26) a well done new release of this PD CAD program, now comes with predrawn common circuit components for insertion into schematics.
WB34: Utilities - Several well done utilities, some will require moderate knowledge of a CLI or Shell for setup, Chatter Box - this one will play any user defined sound after any event (ie. disk insert, mouse click, disk removal...), , Artm - The Amiga real time monitor, gives you full control of the Amiga OS, very powerful program, Helper - help program to make learning the CLI easier, and more!
WB35: 3d Graphics - This disk contains several neat programs to use with your 3d modeling/raytracing programs 3dFonts - Full vector font set for use with 3d programs, FontMaker - make 3d fonts from any

system font, Make3DShape - create 3d shapes from any image, DumptoIFF - create 3d animations preserves pallet, and World3d - a demo program of a front end for use with DKBRender.

WB36: Graphics - On this disk are several programs to create stunning graphical images including, MPath - creates swirling galaxy images, Roses - produce an unlimited number of variations of images that a symmetrically similar to a rose, SimGen - display those spectacular images as part of your workbenck screen, and RayShade - a very good raytracing program, create your own beautiful 3d graphic models with this one!

WB37: Educational - Educational games and puzzles that cover math, geography, spelling, and books. Ages 6 - 15

WB38: Plotting and Graphics - Plotxy is the most powerful full featured plotting package. Used by many colleges and universities. A welcome addition to our library! Highly recommended. Plans - a incredibly well done Computer Aided Drafting program, very full featured. Tesselator - a program that helps generates fantastic looking, recursive M.C. Ecsher type pictures.

WB39: Music - Intuitracker is a German offering of an exquisitely well done program that allows you to play music on your Amiga with CD like controls. Lets you strip out music from your favorite games or others and include them in your music library.

WB40: Music - "CD on a disk", 90 minutes of modern music on this well presented collection. Requires 2 drives or HD.

WB41: Music - MED an incredibly well done, full featured music editor. Create your own stunning music directly on your the Amiga. Similar to SoundTracker but better. Very powerful easy to use program. Ver. 3.10.

WB43:Business - This disk contains AnalytiCalc - probably the most powerful spreadsheet program on the Amiga. A full featured spreadsheet with many features expected in a commercial package. Requires 1.2 MB of memory!

WB46:Clip Art - HighRes clip art with the following motifs - embellishments (borders, dodads ,...), people, and transportation.

WB48: Clip Art - HighRes clip art with the following motifs - Holidays, music, medical, and misc.

WB49abc:Animation Sampler - On this three disk sampler set (counts as two disks) are some of the best animations that have been created over the last three years. Several examples of "Movie" type animations some with spectacular raytraced reality (coolroby, watch, spigot and egg). Also several european style or "Demo" animation with incredible graphics and outstanding electronic music (akrilight, copersine, doc, dps2010, impact, and logodemo). These truly show off the creative edge of an Amiga!

WB50: Animation - Seven of the best european style animations or "Demos", including - scientific 451, subway (a U.S. entrant, also our favorite), sunride, thrstdemo, tnight, waves, and woow.

WB53:Graphics - Raytracing programs generate absolutely stunning realistic looking planes, rockets, buildings..., and surreal images often consisting of highly polished spheres and objects. C-Light is the most powerful EASY-TO-USE of it's kind we have seen to date. This is easily better, and more full featured, than similar commercial programs costing in the hundreds of dollars. Also, sMovie - a full featured video text titler similar to ProVideo, Broadcast Titler. Great video scrolling, wipes, special effects, and more...

WB54:Printing - This disk contains several routines to help with the chore of printing. Includes Gothic - Finally a Banner printer for the PD! PrintStudio -a well implemented all-purpose printer-utility with a very comfortable graphic interface and many advanced features, Lila - with ease, print ASCII files to a PostScript printer, and many more.

Anti-Virus

Only $19.95

The most thorough virus protection money can buy.
Anti-Virus is not Public Domain

WB55:Application - XCopyIII - a full featured disk copier, make backups of copy protected disks. RoadRoute - find the quickest route from one city to another, highway description included. Diary - a diary program like "Dougy Howard M.D", Cal - a calendar program, Magman - a database tailored to maintain records on articles and publications.

WB57:Animation - This disk has several "Demo" style animations, Including, Blitter, Lolly, Sun5, vertigo, vortex, and xenmorph.

WB59:Business - contains a great, very full featured stock market technical analysis and tracking program, also an appointment calendar, and more.

WB61:Intermediate Utilities - Includes programs to help to drasticaly decrease flicker in interlace and hi-res modes (antiflick), an Atari-st emulator, an eprom programmer, turn your amiga into an eight channel digital data analyzer or ocilloscope, and more.

WB62:Midi Utilities - Several useful midi utilities including, programs to transfer to and from several music programs to midi, a midi sysex handler, a midi recorder with timebase, display midi info, file sequence player, and a few scores.

WB63:Disk Utilities #3 - Several highly recommended programs to aid in removing duplicate files from your hard drive, performing file backups, Binary editing, fast formatting, file recovery, disk track recovery, and forced DISK VALIDATION of corrupt disks.

WB66:Icons #2- Lot's of neat icons. Also, several wonderful programs that to let you create your own icons, modify and manipulate icons and info structures.

WB68:Music Utilities - several good utilities for the Amiga music enthusiast. Includes, Noisetracker - a great music creation program, Sonix2MOD - converts sonix to .mod files which then can be used by noisetracker, soundtraker, and MED, SpeakerSim - a speaker design tool demo, Wondersound is an additive harmonic instrument design tool with a separate envelope design window and 16 relative harmonic strength and phase angle controls.

WB69: Music - This disk has over 90 minutes of classical and modern electronic music for you Amiga.

WB70:Desk Top Pub - Atcp - transfer Macintosh screen fonts, Mac or IBM format .AFM metric files, to Amiga screen fonts and PPage .metric files. With this program open door to the libraries of Adobe and PostScript type!, Calendar - month templates in PS form, Post - a full featured post script file display and print utility.

WB75: Music - over 100 instruments files (.inst) and sample sound files (.ss) for your music programs.

WB76: Applications - This disk contains Stichery - a often requested knitting design program, Lotto - a rather complete lottery tracking and prediction utility, SSS - this screen capture program can grab almost any screen including games, Today - a personal calender, Tarot - fortune teller, and Grammar - grammar checker.

WB79: Home & Business Accounting - Includes Ckbacct - the most complete checkbook accounting program going, LCDCalc - this well done calculator has a very large display and operates from the keyboard or mouse, Mileage master - monitor your automobile mileage with this mileage log, Grammar - a grammar checker, and Worldtime - find out what time it is in up to 50 global cities.

WB81: Great Applications - DataEasy a very easy to use, database program. Don't let the ease of use fool you, this is a very full featured database program including full printer control for address labels and mail merge applications. Also includes, TypeTut a good typing tutor, RLC a full featured label printer, Banner, a multi-font banner maker, and Budget a home accounting in a program. Highly recommended.

WB82:Animations - Four full length, well done "movie" style animations. Including, Coyote, JugglerII, GhostPool, and Mechanix.

Two disk set, counts as one!

WB83: Computer Art - this disk has some of the best Amiga generated computer art that we have collected in the past 5 years.

WB85: Graphics - Contains several programs for manipulating 24 Bit color images (ham-e) and a rather nice Iff Image processing package.

WB86: Amiga Vision - Contains the Centurion Press, An Amiga newspaper by Lou Wallace.

WB88abc: The Complete Bible - A three disk set, with the entire text of the New Testament and Old Testament. Great search utilities. Three disk set, counts as three.

WB90: Rippers, Strippers and Beats - For the Amiga music enthusiast, this disk contains many programs designed strip music from your favorite games and programs. Music can then be played with your favorite Pd Music program. Also contains Drums, a very nice drum machine. This disk requires some knowledge of the CLI.

WB93: Workbench Extras #2 This disk contains the utilities that Commodore should have shipped with the Amiga; VirusX4.0, Snap, FixDisk (recover corrupt/deleted files), Disk Optimizer (floppy & hard), MachIII (screen blanker, hotkey, mouse accel., macro, clock utility), GOMF (a gurubuster)and PrintStudio.

WB95: Checkbook Accountant 2.1 This is definitely commercial grade; we've seen many checkbook programs and this is absolutely the best. Full budgeting, transaction recording and report generation.

WB96: Dupers - Contains XcopyIII & Nib which will backup copy-protected programs. FreeCopy removes copy protection from several programs, and SuperDuper will crank-out fast AmigaDOS copies.

WB98: Business - Includes BBaseII a nice, powerful database;

SONY Blank Disks - DSDD

10 for	$ 8.60	(.86 cents ea)
25 for	$18.25	(.73 cents ea)
50 for	$35.50	(.67 cents ea)
100 for	$65.00	(.65 cents ea)

KAO Blank Disks - DSDD

10 for	$ 8.20	(.82 cents ea)
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50 for	$31.50	(.63 cents ea)
100 for	$61.00	(.61 cents ea)

No shipping charge on USA blank disk orders, Canada and Mexico add $.15 each, Other foreign add $.50 ea.

BizCalc--a personal or mortgage loan calculator with amortization capabilities, Loop--a flowchart maker, Formmaker - design professional forms on your Epson LQ-2500 compatible printer.

WB99: Lifestyles - Includes AGene--family tree program that tracks up to 600 people/marriages/etc. Landscape is a CAD program to create gardens/landscapes. Loom simulates an 8 harness loom; experiment with pattern design in an instant feedback environment.

WB100: CaligariPRODemo - Can't afford $3,000+ to see if the granddaddy of 3D rendering software is for you? Then try the demo version of this renowned modeler that the pro's rely on! No built-in save function, requires 68020+ processor.

WB101: Chemesthetics - is a program that displays molecules as a calotte model. This kind of display contains a certain esthetic attitude, even extremely poisonous molecules like nicotine and dioxine look quite nice.

WB102: Telecommunications - Contains the programs NComm 1.921 and VT100-29B. Zmodem protocols, XPR protocol support, full VT100 emulation. NComm's script language is so powerful it comes with a script file that creates a full-featured BBS system.

DD45: AREXX Programs - This disk contains several useful arexx programs and examples, PopCLI4 - The latest of a must have utility.

DD47: Pascal - This disk contains everything needed to program in Pascal. Includes, A68k (1.2) 68000 assembler, Blink linking software and PCQ (1.0) a modest Pascal sub-set compiler.

DD49: C Compiler - contains zc(1.01) fully K&R, zcc(1.0) front end, A68k(1.2) assembler, Blink linker.

DD50: ARexx #2 - a must have set of tutorials on ARexx and several useful examples and utilities for ARexx development.

DD51: Circuit Analysis - Aspice (2.3) A full featured program for electric circuit analysis.

DD52: Scientific - Includes Elements - an incredibly well done periodic table program with source, Scientific plotting - over 600k of Lattice C source routines that can be included in your own programs.

DD54: Compression - This disk is loaded with all of the best file compression programs and aids for the Amiga. Many of the programs can be used by the new user. Includes Arc(2.3), Lharc(1.0), Lhwarp(1.03), Pkax(1.0), PowerPacker(2.3a) a must have by all, Zip(1.0), Warp(2.04), and Zoo(2.0). Also IFFcrunch an excellent compression for IFF files.

DD55: ARP - On this disk you will find the complete ArpRel3.0 release including the full user docs, the full Developers guide. ARP is the official AmigaDOS Resource Project (ARP) release 1.3. ARP makes many improvements to AmigaDOS and makes your system easier to use from the CLI.

AmigaDOS 2 Release

It's Here! It's Here!

Release 2.04 of AmigaDOS for the A500/A2000!!! Includes ROMS, disks and full-documentation. Requires installation. U.S. orders only.

$95.00

WB105A&B: Workbench 2.0 Extras #2

This set contains the programs that should have been included with WB 2.0. These powerful utilities take full advantage of the *many* new capabilities that are available in Workbench 2.0

Tool Manager - a ***"wonderful"*** utility to add programs to your TOOL menu, create a collection of icons on the workbench to easily launch frequently used programs...and much, much more! A true must have utility!!!--ALL of our Amigas rely *heavily* on this utility.

VirusChecker-Drop it in your WBStartup drawer and forget it. *Total* Virus protection will be yours with absolutely no effort!

Icon - Enhances Workbench's "Show All" to display over 40 distinct icons for different types of files (text, graphic, source files, sound samples, libraries, etc., etc.)

Font Editor - Create/edit bitmap fonts with full color support!

Screen Blankers - ala fractals and spliners! No more boring black screen. Colorful, interesting and highly hypnotic effects!

Requester Enhancers - no more stale 'please insert volume' requesters--these are animated requesters for *all* of the system's requesters.

CPUBlit - speeds up text displays for owners of 68020+ CPUs.

Wallpaper - put workbench on top of any IFF picture!

SafeReboot - adds a safe way to reboot your computer...can *greatly* reduce disk validation errors!

Public Screen Utils - allow several separate programs to share the same screen.

Two disk set, counts as two disks.

DD57: Advanced Utilities - Msh - like Cross-dos, copies files to and from MS-DOS, Pal-NTSC - convert any pal program to NTSC and vice versa, Also several utilities that improve your startup-sequence, plus 25 more programs.

DD62: Basic and Xscheme - Cursor - a full featured Amiga Basic compiler, sbasic and ftext - several wonderful routines to help in basic programers, and Xscheme - an interpreted object oriented language.

DD64: Amiga Programmers Manual - The fully comprehensive Amiga programming manual with source code examples and easy to understand tutorials!

DD65: C Tutorials - Several well done tutorials on how to program the Amiga. Includes tutorials and working examples on device drivers, IFF reads/writes, sound and arcade game implementation, double Buffering, and others. A must have for Amiga Programmers.

DD66: Programming ToolBox - Many programs to help in your development efforts (most for C some for basic) Includes programs to generate requesters, an incredible spritemaker toolbox, to greatly aid compiling, convert DPaint brushes to C structures, a great library manager, and many more wonderful time savers!

DD69:Advanced Utilities - SerNet and ParNet - Connect two Amiga's and share resources, MemMonitor - Similar to WFrag but greatly improved, Selector - put menus on your workbench screen, and more.

DD71A&B:C Compiler - This disk contains DICE, Matthew Dillon's full featured, powerful C compiler and environment system. 2 Disks, counts as 2.

DD72: VT Emulators - Contains three powerful full featured VT emulators, with many advanced features including Kermit, Xmodem and Tektronix protocols. VaxTerm, VLT, and more.

DD77: Fortran - Contains a full featured FORTRAN77 environmental development system. Also contains EzAsm a strongly macro dependent 68000 assembler.

DD78: Menus & System Enhancements - Several neat programs to aid in launching programs from special icons (Next computer style), adding WorkBench menus and more. Also contains many useful programs to determine operation system configuration, memory usage, load and many other important utilizations.

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(Memory)

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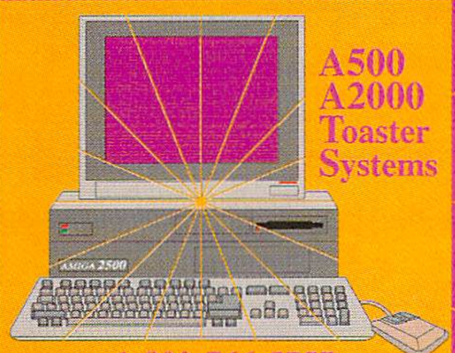
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(Accelerators)

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A3000

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Many other configurations available. Call for details

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The Last Word

Kudos, complaints, comments, concerns, and contributions from our readers.

Virus Vandalism

While a friend and I—both Amiga owners—were waiting in line at a local movie theater, we noticed that the fellow in front of us was reading a PC magazine. My friend and I started to talk about computers, quickly drawing the young man—a high school student, as it turned out—into the conversation, and soon the man behind us also chimed in, saying he owned a PC compatible. To begin with, the conversation was pretty much what you might expect of four computerists, and probably would have continued that way had the younger man not mentioned that a friend of his, whom he considered cool, wrote PC computer viruses as a hobby.

According to this fellow, they recently released a virus on another friend's computer that crashed his hard disk. Apparently, destroying other people's hardware is now considered "fun." It was amazing how defensive he became when the three of us started comparing the releasing of viruses to such acts as keying someone's car, spray-painting graffiti all over walls, or committing arson. In certain circles, all of these things seem to be great fun—for the people doing them—but they are both highly destructive and costly to fix.

It was just this kind of "fun" that lately destroyed two hard disks on Macintoshes in an elementary school where my mother works. The principal was faced with the choice of spending the money to replace the disks or of having two useless computers sitting in the office. Because they were used for so many important jobs, he replaced the disks. The fact remains that the person responsible was a criminal.

Ironically, it was only a few hours after the movie-line conversation that I booted up a disk my friend had given me, only to discover on it a virus often referred to as the "Lamer Exterminator." Only the virus-protection program in my startup-sequence spotted this one. You can find good public-domain protection and elimination programs, and installing them is usually as easy as copying them to your C: directory and altering the Startup_Sequence file using a text editor such as ED or MEMacs. I caught the Lamer Exterminator just in time on this occasion, but I dread the day when a virus that can fool my virus detector manages to eat up my files.

Edward K. Smallwood
Scotts Valley, Calif.

Just Common Sense

Your February editorial is chock full of common sense. Nay to the naysayers, I say! If the Amiga is the kludge the critics claim, what are all those Amigas doing at Lawrence Livermore Labs, the Disney School of Animation, Los Alamos, the IRS, the Queensland, Australia, school system, State University of New York art departments, the School of Visual Arts, and nearly three million homes and businesses? Amiga is the only machine I have found to which it is worth dedicating myself.

Kurt Faasse
Milton, New York

The fact remains that the person responsible was a criminal.

The Juiceless Amiga

While in a Montgomery Ward store during the holidays, I offered the sales staff some free video and sound demos to help highlight the qualities of the Amiga. I went to try them on an A500, but it was unplugged and out of reach of any power outlet! Customers were browsing around blank computer screens in an undermanned department where nobody had any answers.

Come on, Commodore. You should have a marketing team out there training salespeople and ensuring standards for all general Amiga distributors.

Phil Atwood
Rancho Cucamonga, Calif.

Proud Papa

After reading your "Chief Concerns" in the February issue, I want to voice my opinion of the Amiga. I will shortly be the proud owner of a bouncing baby A2000. I did own an A500, but wanted more expansion capabilities. I am purchasing my second Amiga because it is much more exciting to use than an IBM-weenie or a Mac-oholic. And, as an economics major at the University of Winnipeg, I don't use my Amiga just to play games. I don't know where Christoph Herd has looked for serious software, but I can find plenty! Lionheart Press, for example, has excellent business programs.

James Rhodes
Winnipeg, Manitoba

A Happy User

I spent hours on the phone one day searching for additional memory for my accelerator board. Being extremely untechnical, I wasn't sure of what to order, and I'd hoped the dealers could help me. Most were as confused as I.

With much of my hair torn out, I tried Memory World. The salesperson told me to look at the board, asked me a few precise questions, and knew immediately what I needed. The correct SIMMs, fully guaranteed and moderately priced, arrived the next day. It was a pleasure to speak to someone who knew the hardware and was able to make it understandable to me. Thanks, guys!

John Payne
Franklin Lakes, New Jersey ■

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2. Of the topics listed below, which 5 do you think should rceive the most coverage? (Please choose no more than 5.)
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h. ☐ CD-ROM technology
i. ☐ CDTV
j. ☐ Database management
k. ☐ Desktop publishing
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o. ☐ 3-D graphics/animation
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r. ☐ Multimedia production/presentation
s. ☐ Music/sound
t. ☐ Operating system software
u. ☐ Programming
v. ☐ Science/engineering (CAD, Unix, etc.)
w. ☐ System upgrade/expansion (hardware)
x. ☐ Telecommunications
y. ☐ Video
z. ☐ Word processing

3. Which 4 regular monthly sections (not articles) of *AmigaWorld* do you find most valuable?
1. ☐ Accent on Graphics 6. ☐ Help Key
2. ☐ Back Talk 7. ☐ The Last Word
3. ☐ Chief Concerns 8. ☐ Overscan
4. ☐ Crib Notes 9. ☐ Reviews (General)
5. ☐ Game Reviews a. ☐ Video Suite

4. Which 4 regular monthly sections (not articles) of *AmigaWorld* do you find least valuable?
b. ☐ Accent on Graphics g. ☐ Help Key
c. ☐ Back Talk h. ☐ The Last Word
d. ☐ Chief Concerns i. ☐ Overscan
e. ☐ Crib Notes j. ☐ Reviews (General)
f. ☐ Game Reviews k. ☐ Video Suite

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3	28	53	78	103	128	153	178
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6	31	56	81	106	131	156	181
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b. ☐ Amiga 1000 e. ☐ Amiga 3000
c. ☐ Amiga 2000 f. ☐ Don't own an Amiga

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j. ☐ Database management
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l. ☐ Education
m. ☐ Games/entertainment
n. ☐ 2-D graphics/animation
o. ☐ 3-D graphics/animation
p. ☐ Home productivity and finance
q. ☐ IBM/Mac emulation/conversion
r. ☐ Multimedia production/presentation
s. ☐ Music/sound
t. ☐ Operating system software
u. ☐ Programming
v. ☐ Science/engineering (CAD, Unix, etc.)
w. ☐ System upgrade/expansion (hardware)
x. ☐ Telecommunications
y. ☐ Video
z. ☐ Word processing

3. Which 4 regular monthly sections (not articles) of *AmigaWorld* do you find most valuable?
1. ☐ Accent on Graphics 6. ☐ Help Key
2. ☐ Back Talk 7. ☐ The Last Word
3. ☐ Chief Concerns 8. ☐ Overscan
4. ☐ Crib Notes 9. ☐ Reviews (General)
5. ☐ Game Reviews a. ☐ Video Suite

4. Which 4 regular monthly sections (not articles) of *AmigaWorld* do you find least valuable?
b. ☐ Accent on Graphics g. ☐ Help Key
c. ☐ Back Talk h. ☐ The Last Word
d. ☐ Chief Concerns i. ☐ Overscan
e. ☐ Crib Notes j. ☐ Reviews (General)
f. ☐ Game Reviews k. ☐ Video Suite

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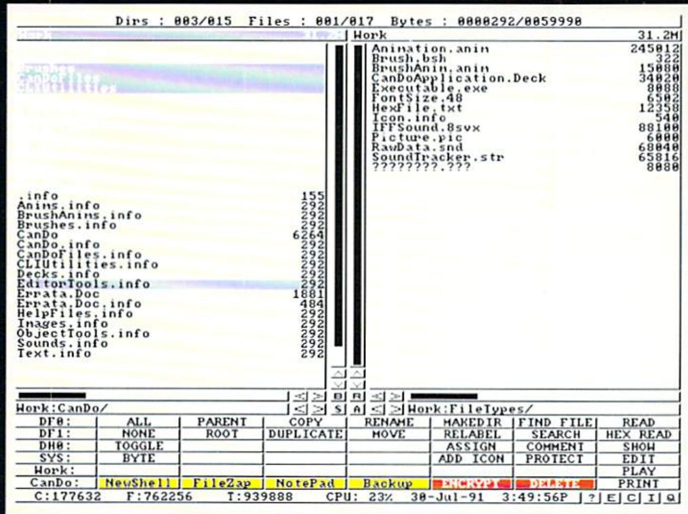
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